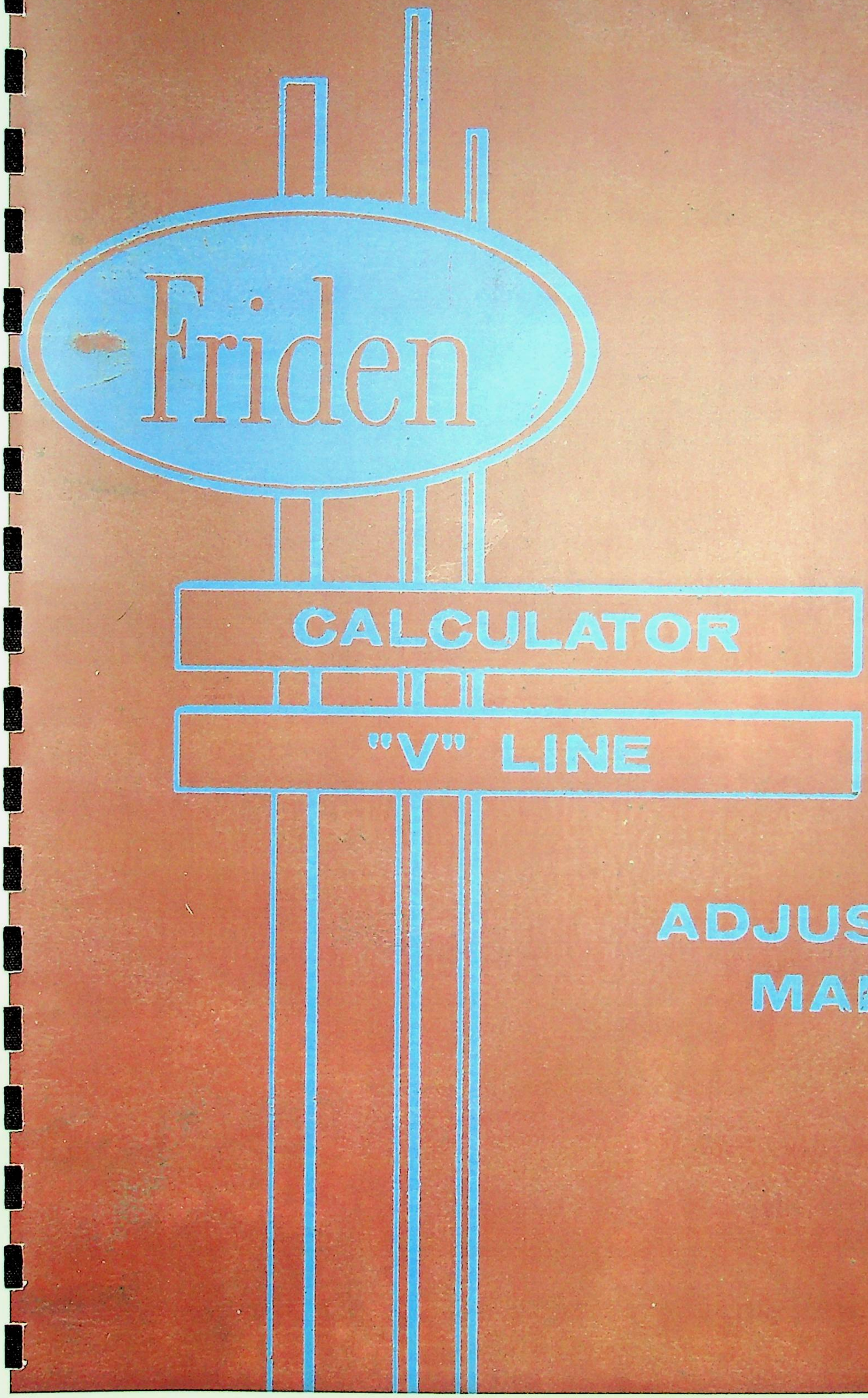

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CALCULATOR

"V" LINE

ADJUSTMENT MANUAL

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ADJ. 1 - TIMING & ADJUSTMENT OF DRIVE SHAFT ASSEMBLY

FIG. 1 - DRIVE SHAFT HOME POSITION

Rotate the drive shaft until the stud on the add release cam is facing up and to the front of the machine. Then engage the clutch with the add release cam so the clutch dog is toward the front of the machine and engaged with the clutch release dog.

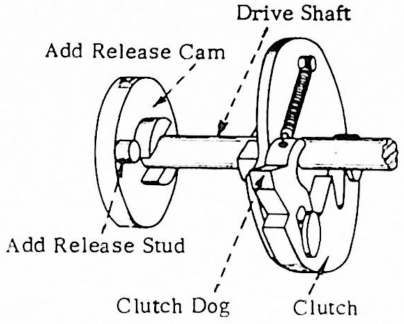


FIG. 1

FIG. 2 - DRIVE SHAFT BACK-UP PAWL

With the drive shaft in home position, the drive shaft back-up pawl is to have .010" to .020" clearance to the drive shaft rebound cam. To adjust, rotate the eccentric.

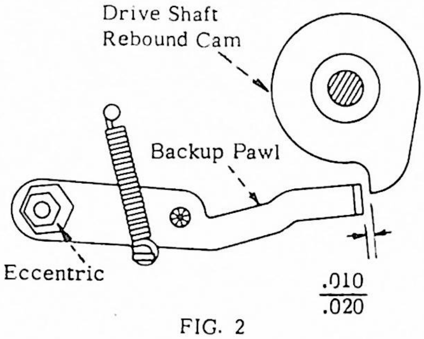


FIG. 2

FIG. 3 - ACTUATOR TIMING

With the drive shaft in home position, the actuators are to be installed with their timing marks pointed straight up.

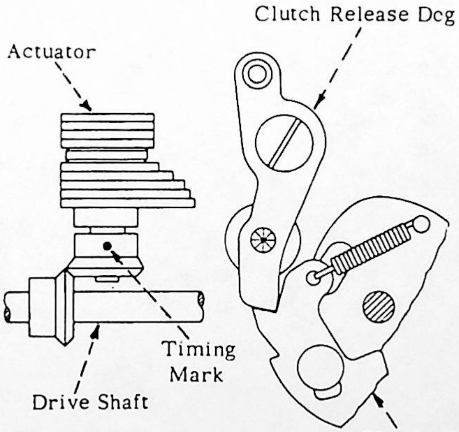
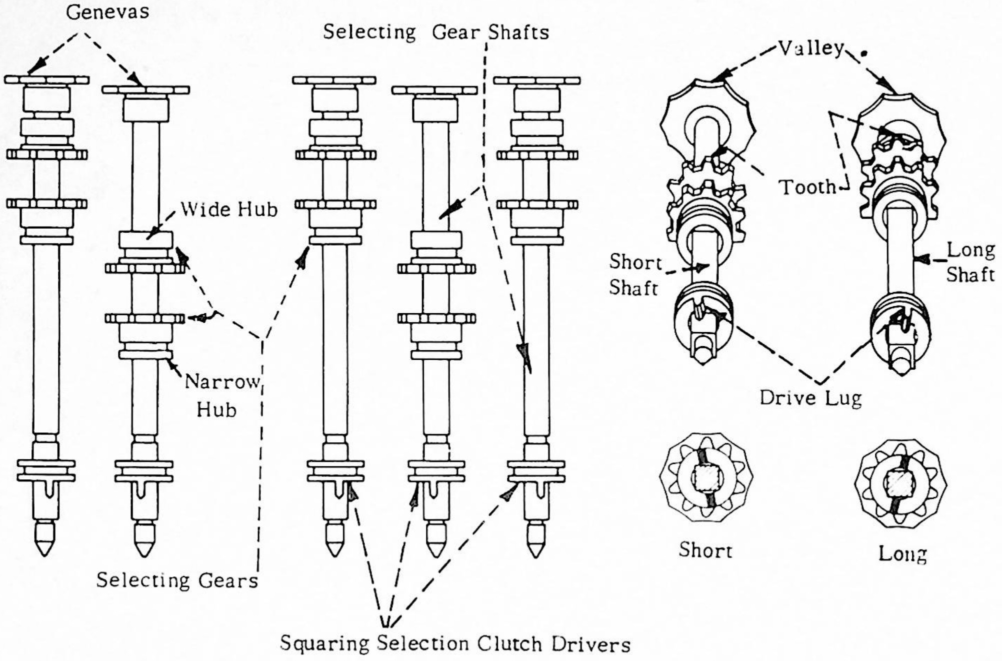


FIG. 3

ADJ. 2 - SELECTING GEAR SHAFTS, SELECTING GEARS, & SQUARING CLUTCH DRIVERS



SELECTING GEAR TIMING

The two selecting gears on each selecting gear shaft are identified by their wide and narrow hubs. (The wide hub has its selecting arm groove at the inner end of the hub next to the gear teeth. The narrow hub has its selecting arm groove at the outer end of the hub.) A pair of these selecting gears are slipped on each selecting gear shaft with their hubs facing out and with their teeth aligned with the valleys on the genevas.

SELECTING GEAR SHAFTS

Starting from the right side of the machine, the selecting gear shafts are installed: #1 long, #2 short, #3 long, #4 short, and alternately long, short through to #10 which is short.

SQUARING SELECTION CLUTCH DRIVERS

The squaring selection clutch drivers are installed on the end of the long and short selecting gear shafts as follows:

The squaring selection clutch drivers on the long selecting gear shafts are to have their drive lugs slightly off center to the right and aligned with the valley of the selecting gears.

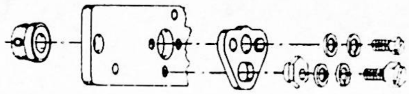
The squaring selection clutch drivers on the short selecting gear shafts are to have their drive lugs slightly off center to the left and aligned with the valley of the selecting gears.

ADJ. 3 - ACTUATORS AND GENEVAS

FIG. 1 - GENEVA CLEARANCE

There is to be .001" to .002" clearance between the genevas and the geneva transfer stops. To adjust, raise or lower the actuator bearings as required.

Note: Due to eccentricity of the genevas and actuators, the clearance is to be set to the highest side of the genevas. Check the adjustment on all ten points. After adjusting the actuator bearings, be sure to rotate the holding eccentrics clockwise and tighten securely. These eccentrics are not for adadjustment, but only to prevent the adjustment from slipping.



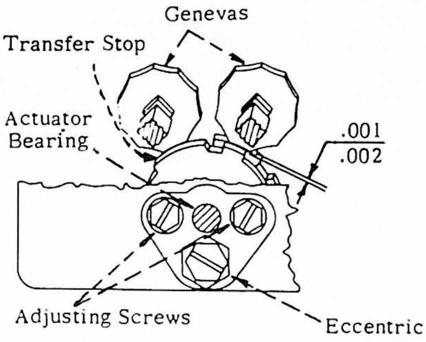


FIG. 1

FIG. 2 - ACTUATOR BACKLASH & DRIVE SHAFT END PLAY

1. The actuators are to be free to rotate but are not to have more than .000" to .003" end play. To adjust, move the drive shaft as far to the left as possible. Then move the thrust collars rearward against the bearing plate and tighten the set-screws. Check to see that the actuators are free to rotate and that the set-screws do not contact the transfer pins.

2. The drive shaft is to have NO END PLAY, must be perfectly free, and the miter gears are to have minimum backlash. To adjust, loosen the set-screws on the miter gears (#3 miter gear is fixed) and move the drive shaft to the right until the #3 actuator miter gear has minimum backlash. Tighten the drive shaft thrust bearing, and then move the adjustable miter gears for minimum backlash to the remaining actuator miter-gears.

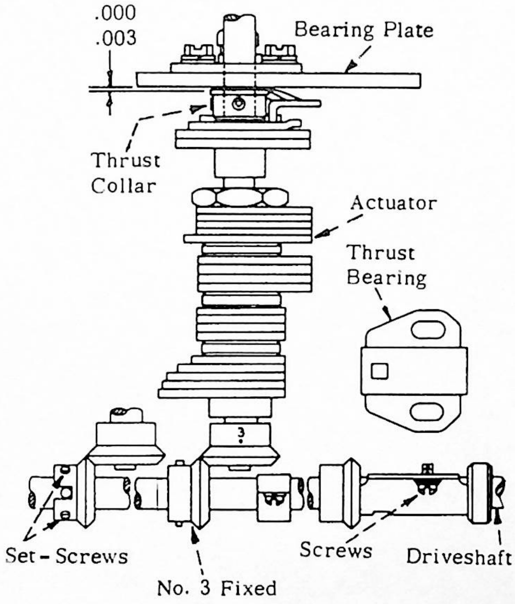
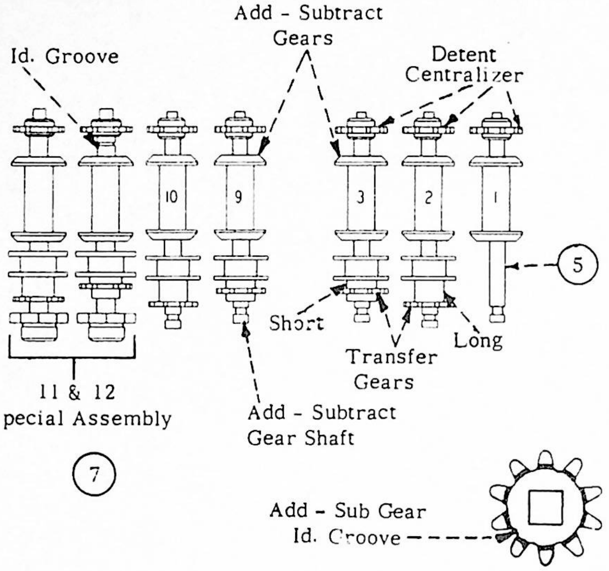
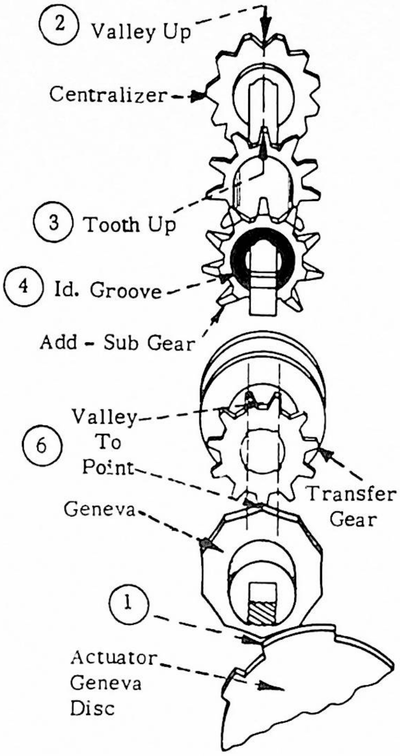


FIG. 2

ADJ. 4 - TIMING THE ADD-SUBTRACT GEAR SHAFT ASSEMBLIES





The timing and assembly of the add-subtract gear shaft assemblies is to be as follows:

1. Starting with the #1 add-subtract gear shaft assembly, rotate the drive shaft slowly until the actuator geneva disc is under its geneva (to prevent rotation of the selecting gear shaft).

2. The detent centralizers are to have a valley straight up.

3. The add-subtract gears are to have a tooth straight up and in-line with the valley on the centralizers.

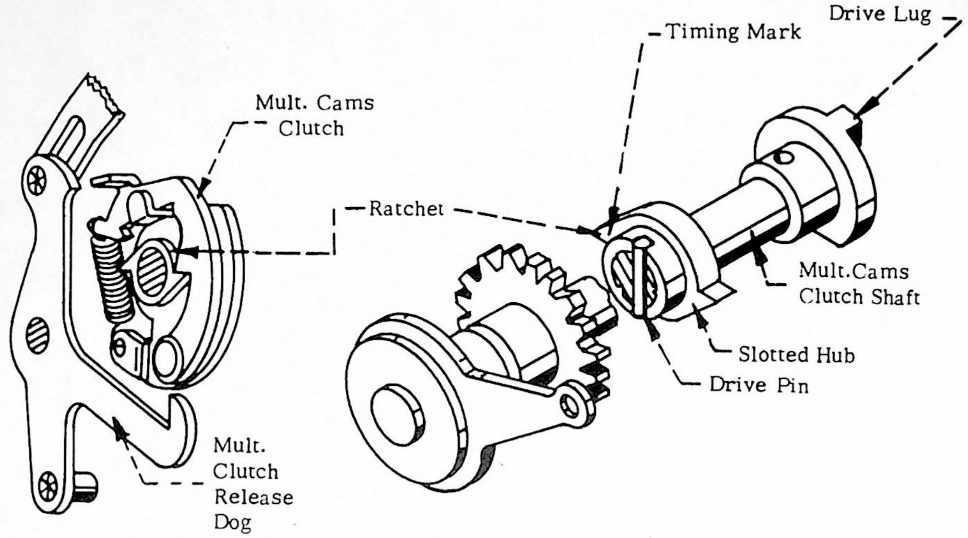
4. The #1 add-subtract gear is to have its identification groove to the rear. The #2 add-subtract gear is to have its identification groove to the front. Then alternately rear, front, for the remaining identification grooves.

5. No transfer gear on the #1 add-subtract gear shaft. Starting with a long transfer gear on the #2 add-subtract gear shaft. the remaining transfer gears are: #3 short, #4 long, and then alternately continuing--short, long, short, long.

6. The valley between the teeth on the transfer gears is to align with the points on the genevas.

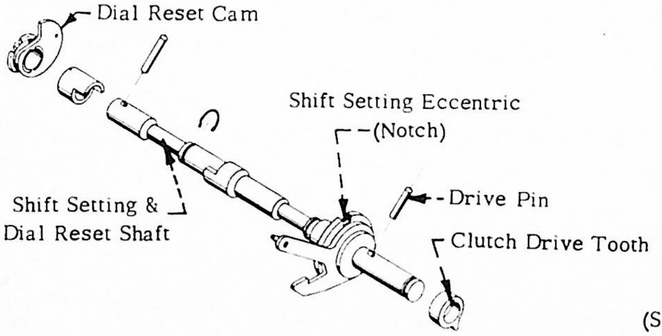
7. Two special add-subtract gear shaft assemblies are provided for the #11 and #12 add-subtract gear positions. The shaft on the #11 assembly has a groove just in front of the detent centralizer for identification.

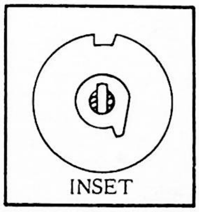
ADJ. 5 - MULT CAMS CLUTCH RATCHET



With the coupling drive lug for the mult cams clutch shaft facing up (small end of taper pin up), the ratchet for the mult cams clutch is to have its slotted hub engaged on the drive pin with the hub facing out and the timing mark on the ratchet tooth facing the rear of the machine.

ADJ. 6 - BACK TRANSFER CLUTCH DRIVE TOOTH



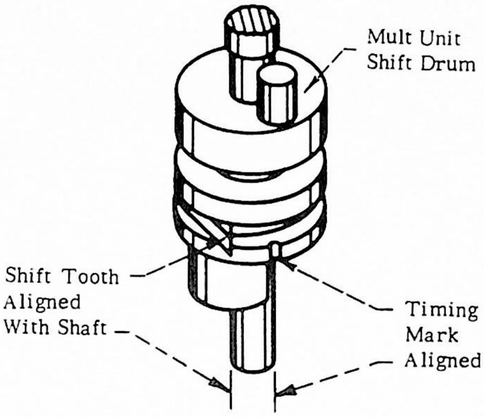


(Showing Alignment of Parts)

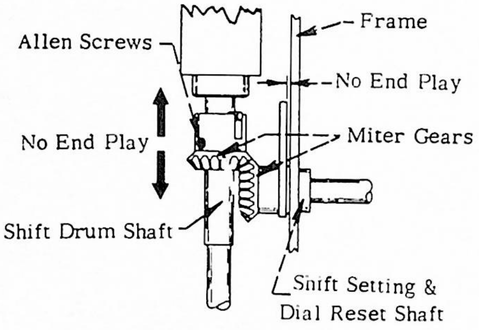
With the machine in home position and looking at the shift setting and dial reset shaft from the right end, the back transfer clutch drive tooth is to engage the drive pin so the tooth is facing down and to the rear in respect to the notch on the shift setting eccentric.

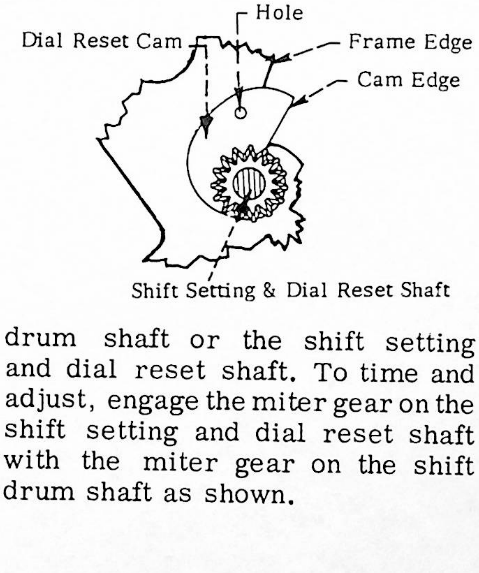
ADJ. 7 - MULT UNIT SHIFT TOOTH

With the drive shaft in home position, the mult unit shift tooth is to be aligned with the left side of the mult unit shift shaft; and the timing mark is to be aligned with the right side of the shaft. To time, loosen the upper bearing support bracket and disengage the miter gear. Then rotate the mult unit shift shaft until the shift tooth and the timing mark are positioned as shown.



ADJ. 8 - SHIFT SETTING & DIAL RESET SHAFT





With the drive shaft in home position, the dial reset cam is to be timed so the frame edge is centered between the timing hole and the cam edge. Also, there is to be NO END PLAY in either the shift drum shaft or the shift setting and dial reset shaft. To time and adjust, engage the miter gear on the shift setting and dial reset shaft with the miter gear on the shift drum shaft as shown.

ADJ. 9 - TRANSFER TOOTH AND RESTORE ARM

FIG. 1 - TRANSFER RESTORE ARM

The transfer restore arm must fully restore the transfer pin to its detented position. To adjust, form the transfer restore arm for minimum clearance to the bearing plate.

Note: These parts are easily cracked or broken if formed excessively. Use extreme care when making the adjustment.

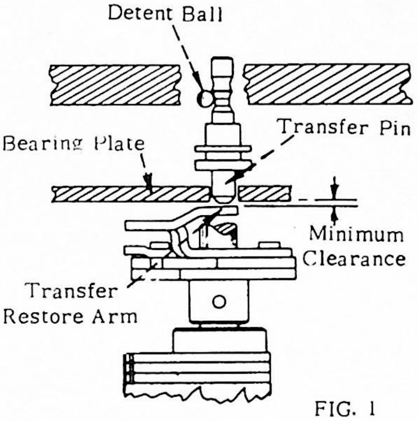


FIG. 1

FIG. 2 - TRANSFER TEETH CLEARANCE

The transfer teeth on the actuators must pass between the transfer gears and genevas with equal clearance at all four points. With the long transfer gear held rearward, the tooth is not to pick up the transfer gear or the geneva. To adjust, form the transfer teeth.

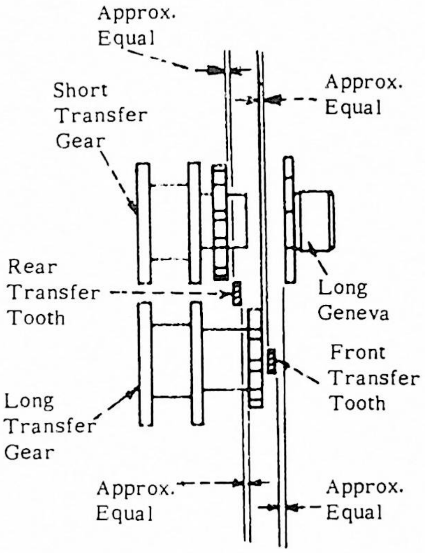


FIG. 2

ADJ. 10 - TIMING OF DIVISION DRIVE GEAR & DIVISION IDLER GEAR

FIG. 1 - DIVISION IDLER GEAR

To install the division drive gear and the division idler gear, have the machine in home position and position the two gears so their timing marks are aligned. Then align the drive shaft taper pin hole with the hole in the drive gear hub so the pin can be driven in from the top.

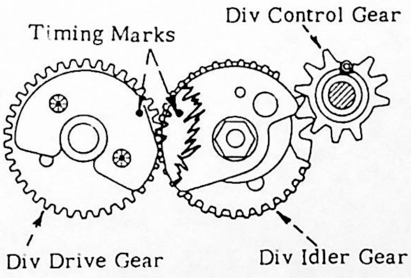


FIG. 1

ADJ. 10 - TIMING OF DIVISION DRIVE GEAR & DIVISION IDLER GEAR (Cont.)

FIG. 2 - DIVISION CONTROL GEAR

When the division control gear is in home position (notch on gear seated over stop pin), the high point of the division throwout cam is to be pointed downward and the flat side of the disabling cam is to face the front of the machine.

Note: Install the taper pin from the bottom side of the division control gear.

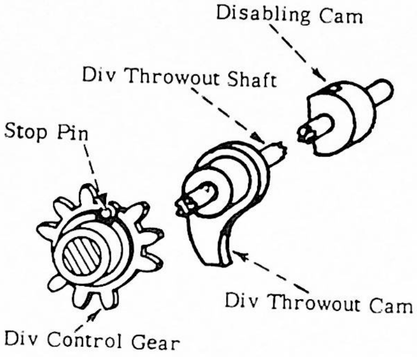


FIG. 2

FIG. 3 - GATE POWER SET CAM & GEAR

The roller on the minus gate bellcrank MUST fit in the notch on the drive cam so the roller will be immediately picked up on the first motion of the drive cam.

Note: The timing marks on the division drive gear and the gate power set cam and gear are to be ignored for this adjustment.

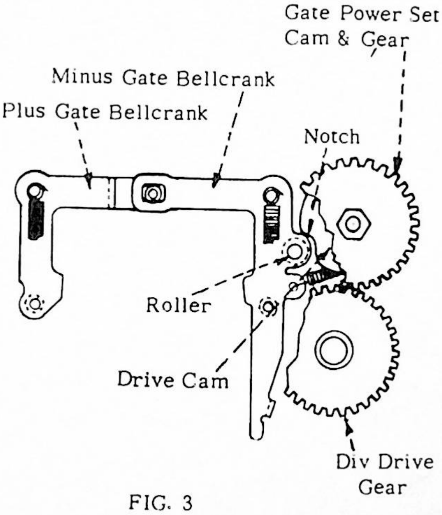
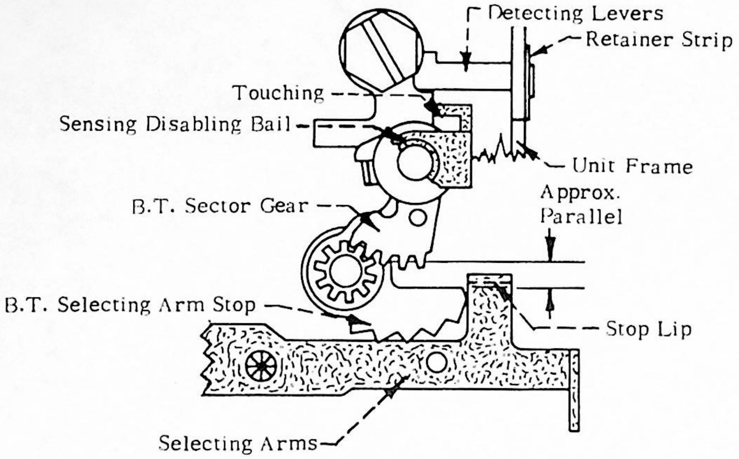


FIG. 3

ADJ. 11 - BACK TRANSFER PROGRAM UNIT



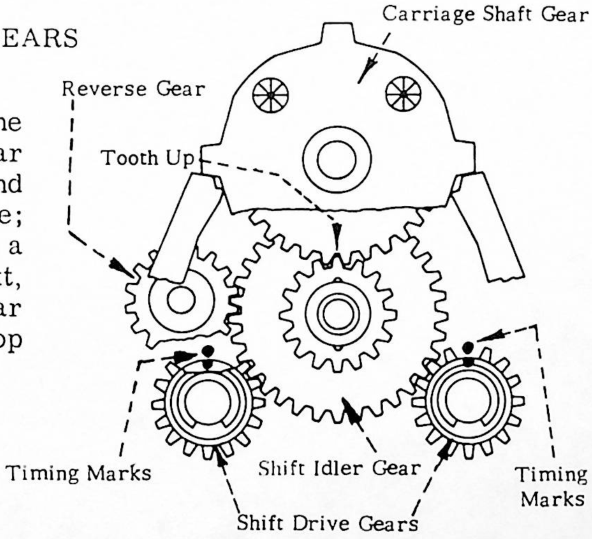
1. Check to see that the stop lips on the selecting arms are all aligned. If not, form the stop lips forward or rearward as necessary.

2. Check to see that the sensing disabling bail is parallel to the unit frame and touching the back edge of each detecting lever.

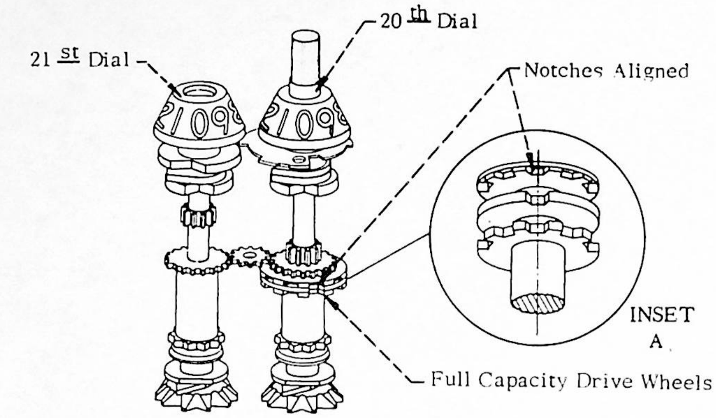
3. Engage the back transfer selecting arm stops with the teeth on the back transfer sector gears so the top edge of the selecting arm stops are approximately in-line (parallel) with the stop lips on the selecting arms.

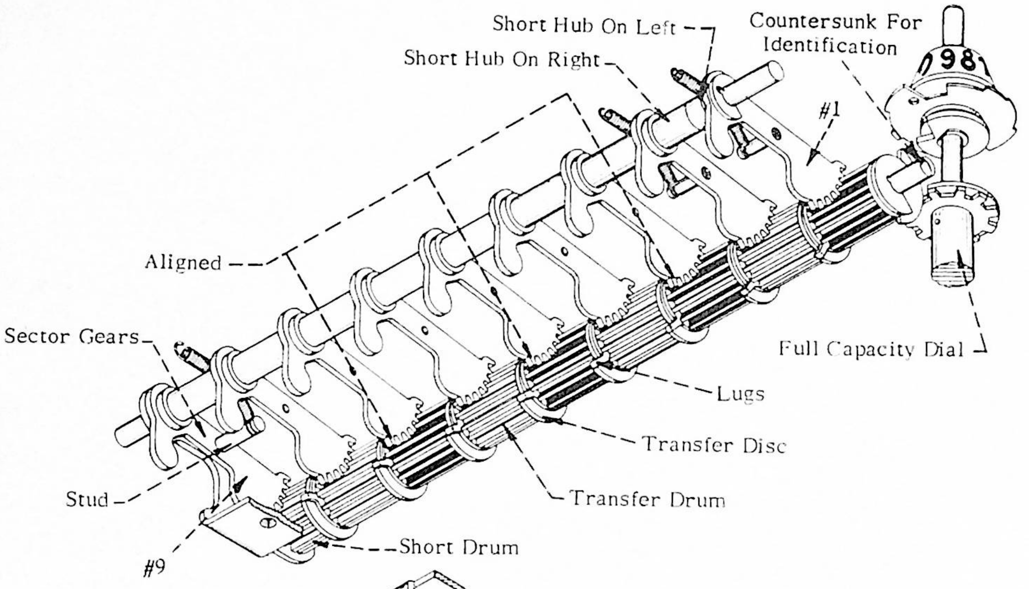
ADJ. 12 - CARRIAGE SHIFT GEARS

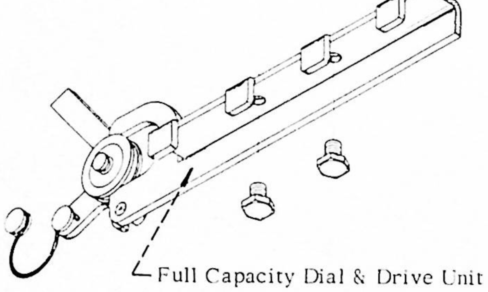
When the timing marks on the shift drive gears and the rear bearing plate are aligned, and the reverse gear is in place; install the shift idler gear with a tooth of its small gear up. Next, install the carriage shift gear with its lugs parallel to the top of the bearing plate.

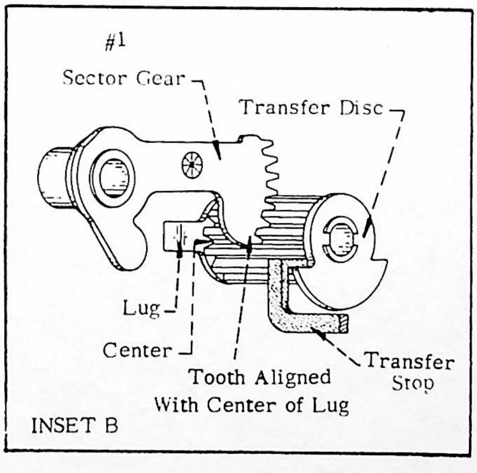


ADJ. 13 -FULL CAPACITY UNIT









ADJ. 13 - FULL CAPACITY UNIT

TIMING OF 20th and 21st DIALS

With the 20th and 21st dials at zero, the three notches on the full capacity drive wheels are to be aligned as shown in Inset A.

TRANSFER DRUMS

The transfer drums are assembled on the shaft with the transfer discs to the right and with the lugs positioned over the top of the adjacent transfer discs. The drums are identified by nickel or cadmium plating. The 1,3,5 and 7 drums are nickel plated while the 2,4,6,8 and 9 drums are cadmium plated.

SECTOR GEARS

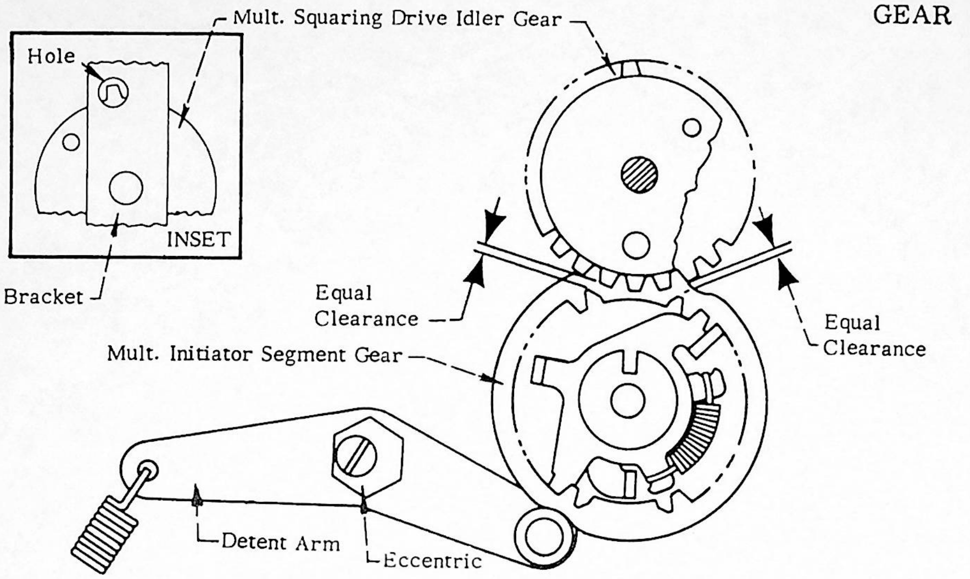
The sector gears are identified and assembled on their shaft as follows:

#1 position has a short hub with a spring stud on the hub side. Install with hub on left side. #2 position has a short hub with spring stud on opposite side of hub. Install on shaft with hub facing right side. #3 thru #8 have long hubs. Install on shaft with hub facing right side. #9 position has a long hub and a spring stud. Install with hub facing right side.

TIMING OF SECTOR GEARS WITH TRANSFER DRUMS

With the transfer stop positioned over the #1 transfer disc and the lugs on the transfer drums tight against the ends of the transfer discs, the bottom tooth on the #1 sector gear is to be aligned with the center of the lug on the #1 transfer drum as shown in Inset B. The remaining sector gears are to be meshed with the transfer drums so the bottom tooth on each sector gear is aligned with the bottom tooth on the #1 sector gear.

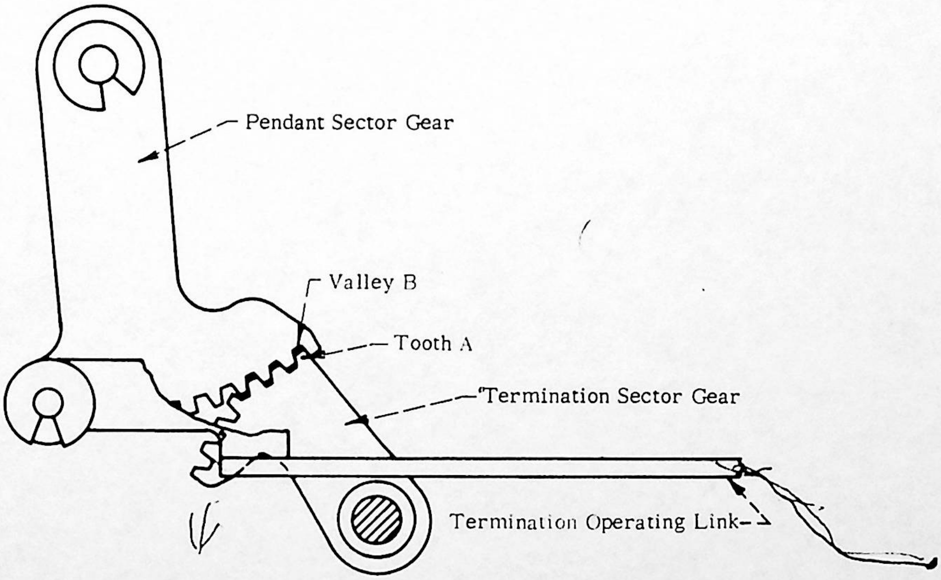
ADJ. 14 - TIMING & CLEARANCE OF THE MULT-SQ. DRIVE IDLER GEAR



1. With the drive shaft in home position, the single tooth on the mult squaring drive idler gear is to be centered in the bracket hole as shown in the Inset.

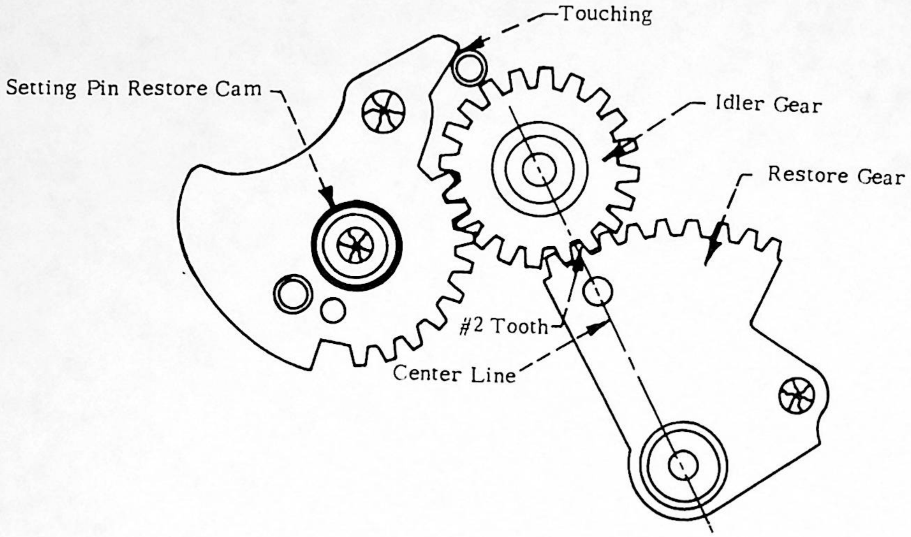
2. With the mult initiator segment gear in either of its two detent positions, and the drive shaft cycled, the teeth on the mult squaring drive idler gear are to clear the teeth on the mult initiator segment gear with approximately equal clearance. To adjust, turn the eccentric on the detent arm.

ADJ. 15 - PENDANT SECTOR GEAR TO TERMINATION SECTOR GEAR



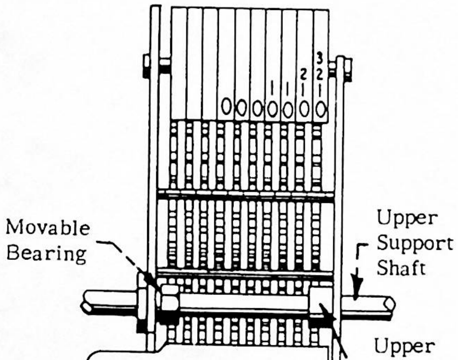
With the termination operating link connected to the unit restore lever and to the pendant sector gear, tooth A on the termination sector gear is to be engaged in the valley B on the pendant sector gear.

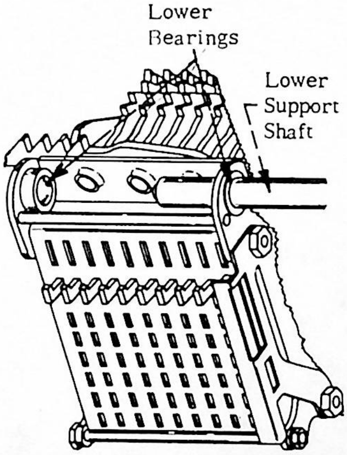
ADJ. 16 - MULT UNIT RESTORE GEARS



With the #2 tooth on the restore gear in line with the center of the idler gear, install the setting pin restore cam so the tip of the cam is against the stud on the unit side frame. Then install the opposite setting pin restore cam so its tip is facing the same direction.

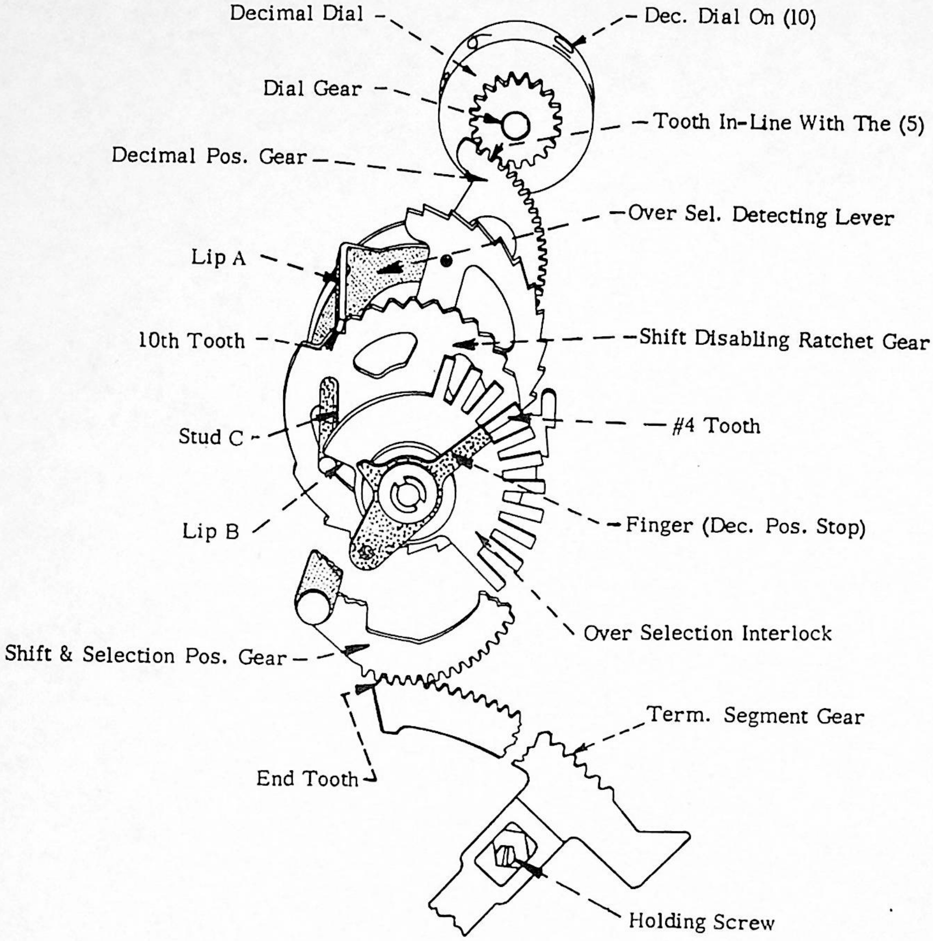
ADJ. 17 - ALIGNMENT OF THE MULT UNIT BEARINGS





Before installing the mult unit, align the lower support shaft bearings until the shaft is perfectly free to move back and forth through the bearings without binding or hanging up. Then install the mult unit and align the movable bearing on the unit side frame until the unit is perfectly free to move back and forth across both support shafts without binding or hanging up.

ADJ. 18 - TERMINATION SEGMENT GEAR & DECIMAL DIAL



1. Escape the mult unit all the way to the left.
2. Rotate the parts counter clockwise and engage lip A into the 10th tooth space on the shift disabling ratchet gear. Lip B is to contact stud C and the finger on the decimal positioning stop is to be aligned with the #4 tooth on the over selection interlock.
3. While holding the parts rotated in this position, engage the end tooth on the termination segment gear into the 2nd tooth space (between the 2nd and 3rd teeth) on the shift and selection positioning gear.
4. Keep upward pressure against the termination segment gear until the holding screw is tightened.
5. Install and engage the decimal dial so the gear tooth in line with the "5" is engaged in the valley between the 1st and 2nd teeth on the decimal positioning gear. When properly timed, the dial will not rotate past 10 nor past 1.

ADJ. 19 - MOTOR

FIG. 1 - LEFT SHIFT KEY LATCH

The closing of the motor switch contacts and starting of the motor is adjusted to the left shift key; therefore, it is necessary to adjust the latching of the left shift key prior to adjusting the micro switch. With the drive shaft in home position and the left shift key slowly depressed, the locking lug on the keystem is to clear the left shift key latch on the shift contact and levers assembly by .002" to .005". To adjust, loosen the screw and move the left shift key latch. When the drive shaft is half cycled, check to see that the key is held depressed.

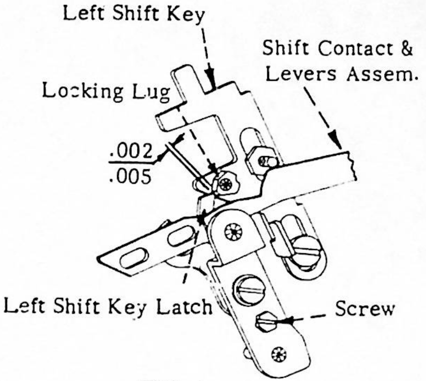


FIG. 1

FIG. 2 - MICRO SWITCH & SLIP CLUTCH

1. The micro switch is to close as soon as possible on depression of any operating key. To adjust, form the micro switch blade.

2. When the slip clutch slips, it is to slip just long enough to bring the trip pin into position for contacting the switch link latch. This will open the micro switch and stop the motor. To adjust, form the lip on the switch link latch for approximately .030" clearance to the trip pin. Test under power by catching the crank handle with the heel of your hand. Increase or decrease the clearance to obtain minimum delatch time.

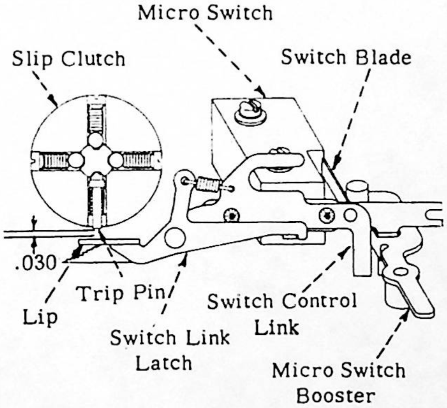


FIG. 2

Continued On Next Page

ADJ. 19 - MOTOR (Cont.)

FIG. 3 - MOTOR SPEED -- MOTOR ALIGNMENT

1. The drive shaft is to rotate at 490 to 500 rpm. To adjust, open or close the governor points by means of the adjusting screw.
2. The governor is to clear the brush holders by .010" to .030". To adjust move the governor.
3. The motor is to be aligned for minimum vibration. To adjust, move the motor.

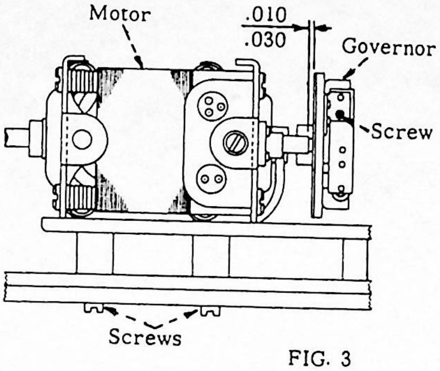


FIG. 3

FIG. 4 - MOTOR WIRING

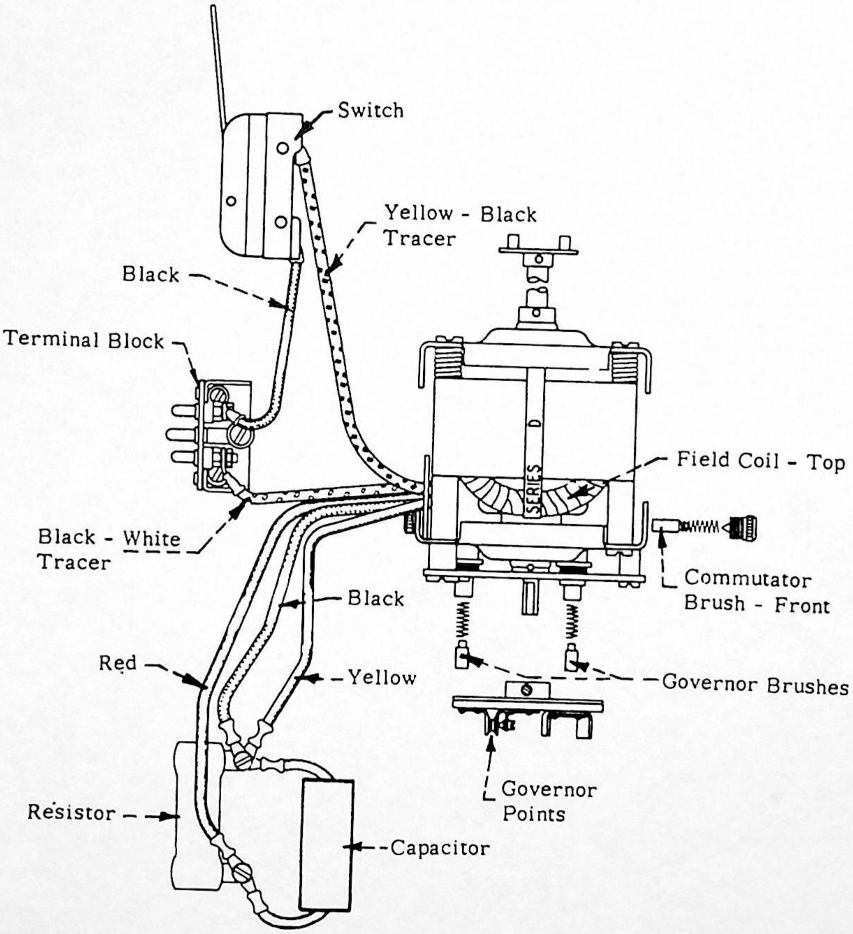


FIG. 4

ADJ. 1 - SELECTION

FIG. 1 - SELECTING GEAR NEUTRAL CLEARANCE

1. With the selecting arms in their fully restored position, the selecting gears are to clear the actuator segments with 60% clearance to the front and 40% clearance to the rear. To adjust form the selecting arm yokes.
2. The selecting arm yokes must engage the selecting gears deep enough to prevent disengagement but without binding the selecting arms. To adjust, form the selecting arms up or down as required.

Note: On machines with back transfer, less than 60% clearance on this adjustment will cause a pick-up on selection during a selection of 0's.

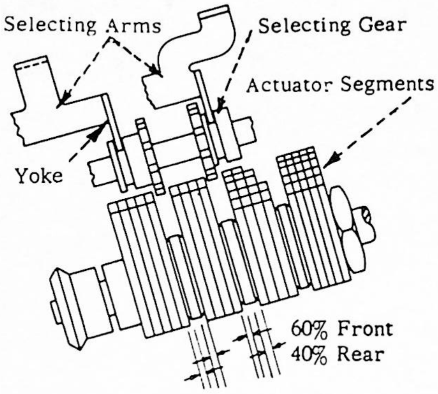


FIG. 1

FIG. 2 - SELECTING ARMS

After the selecting gear neutral clearance is adjusted as above, check each selecting arm for FREE movement, by pulling the selecting arm down and then slowly allowing it to restore while still holding the finger on the arm. If any bind or drag exists, check the selecting arm at the 7 points shown and form the arm as necessary to free it up.

Note: The support bars are to be perfectly straight. Not bowed up or down.

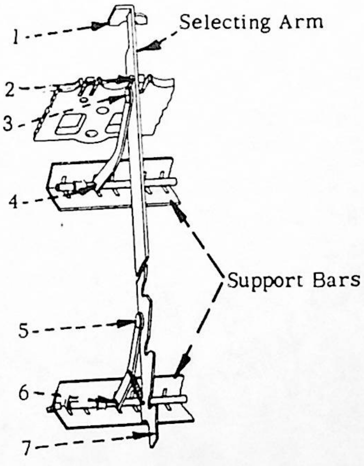


FIG. 2

ADJ. 1 - SELECTION (Cont.)

FIG. 3 - SELECTING GEAR ENGAGEMENT

When a selecting gear is actuated by its selecting arm, the selecting gear is to engage the actuator segment with a 65% to 85% bite. To adjust, loosen the screw on each end of the square rod and move the keyboard forward or rearward with the eccentrics. Check the selection by using 2's and 6's, 3's and 7's, and 4's and 8's.

Note: Once the keyboard is adjusted it can be removed without disturbing the adjustment. Be sure to rotate the square rod at an angle to secure the adjustment.

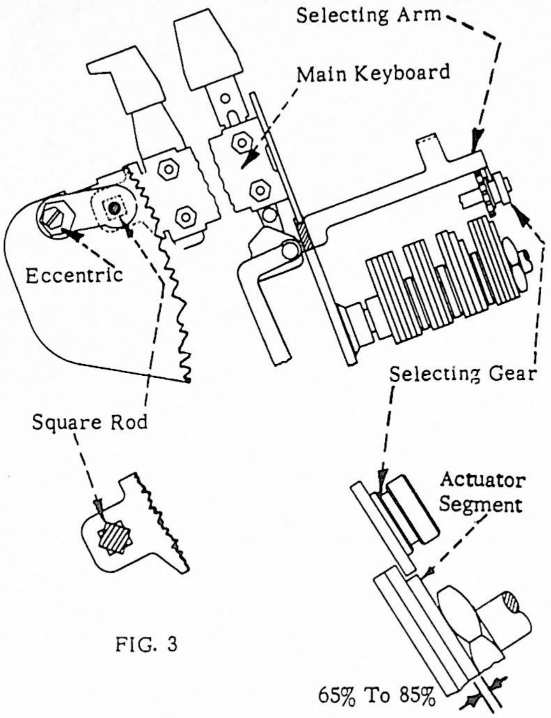


FIG. 3

ADJ. 2 - KEYBOARD CLEAR

FIG. 1 - MAIN KEYBOARD RELEASE

1. With the machine in home position, the stud on the keyboard clear link is to have minimum clearance to the keyboard clear arm. To adjust, form the keyboard clear link at offset A. Then by raising and lowering the column clear and lock keys, check to see that the selection release arms are free to reposition in the notches on the keylock bars as shown in the Inset.

2. With all 3's selected in the main keyboard and the keyboard repeat key to the rear, cycle the machine in "plus" until the keyboard clear link is at its maximum rearward movement. At this point, the selecting keys are to be released and the keyboard clear link is to have some overtravel remaining. To adjust, form the keyboard clear lever link.

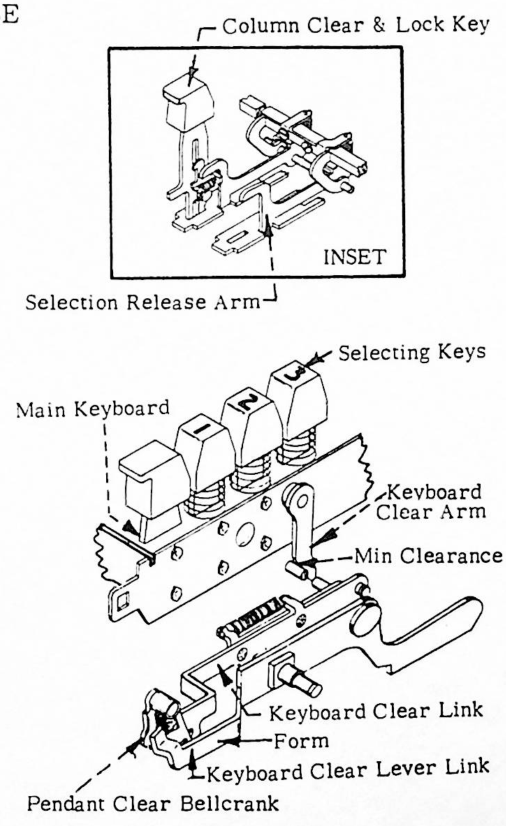


FIG. 1

Continued on Next Page

ADJ. 2 - KEYBOARD CLEAR (Cont.)

FIG. 2 - BACK TRANSFER SELECTION RELEASE

At the completion of a back transfer operation, the back transfer gate is to be latched in the forward position with a 100% engagement of the gate latch arm on the back transfer selecting latch. To adjust, form the back transfer clear link.

Note: After adjusting, check to see that the back transfer gate is delatched on a power cycle keyboard clear operation.

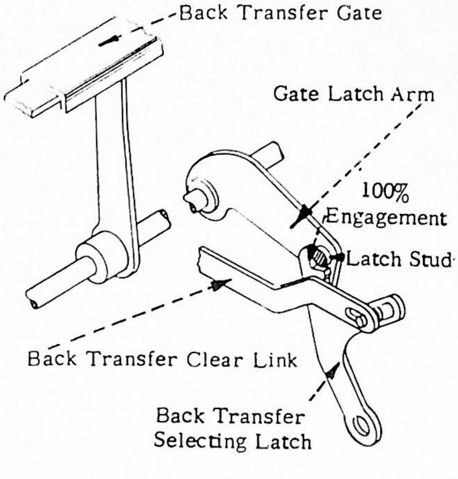


FIG. 2

ADJ. 3 - DISABLING OF KEYBOARD CLEAR

FIG. 1 - MULT KEY LATCHES

The latch lips on the mult key latches are to be parallel to the mult keyboard top plate and aligned with each other so they have equal engagement with the mult keys. To adjust, form the latch lips as required. Note: Once the latches are properly adjusted, do not change them as this will effect the latching point for the clutch release.

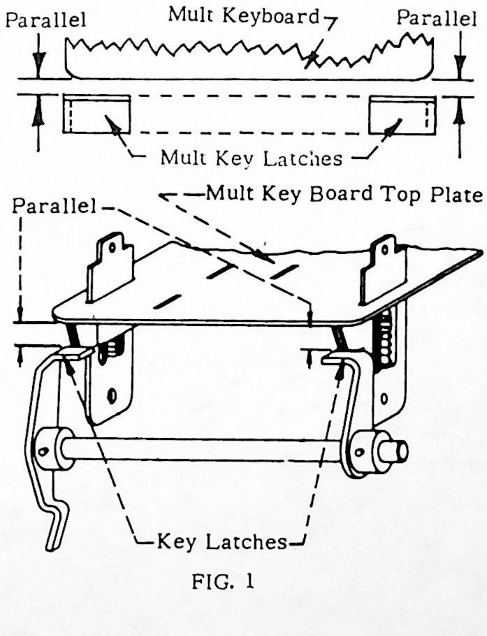


FIG. 1

ADJ. 3 - DISABLING OF KEYBOARD CLEAR (Cont.)

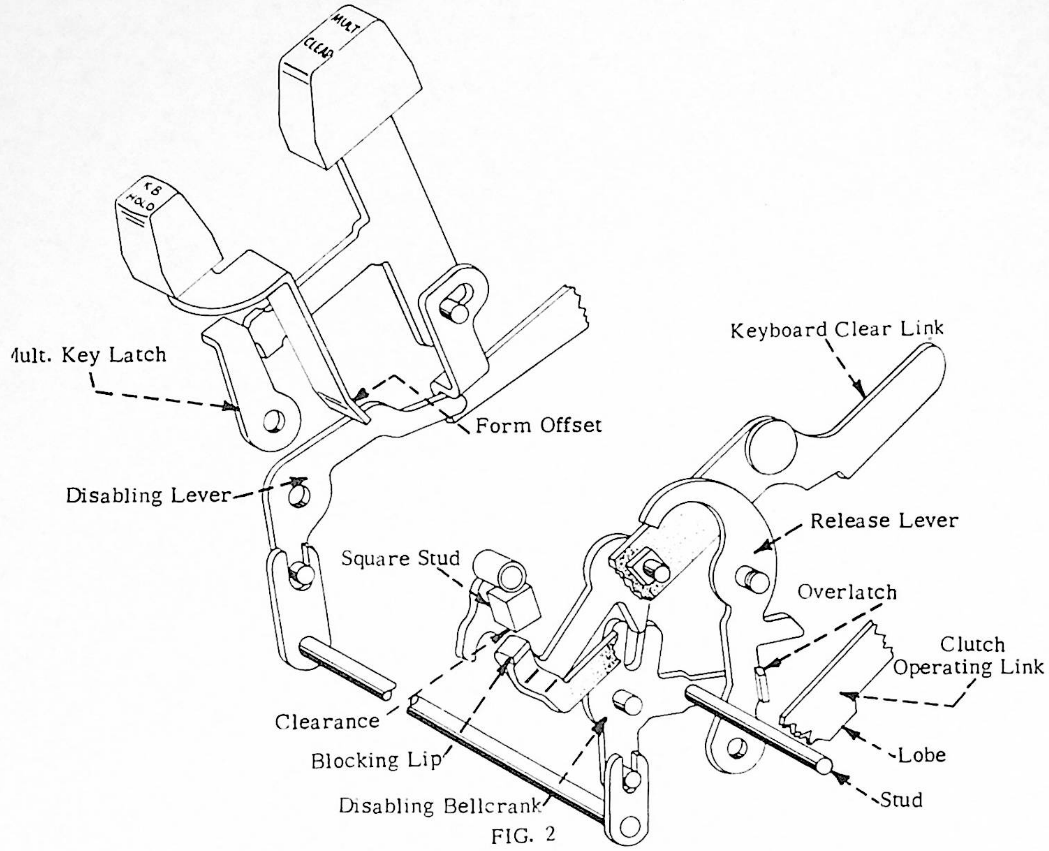


FIG. 2 - MULT CLEAR KEY & KEYBOARD HOLD KEY

1. With the keyboard repeat key to the rear and either the mult clear key or the keyboard hold key is depressed and latched (but not held down), the lip on the disabling bellcrank is to latch under the release lever with a safe overlatch. To adjust for the mult clear key, form the disabling lever. To adjust for the keyboard hold key, form the keyboard hold key at the offset.

2. With the machine cycled in any operation that will cause a keyboard clear, the blocking lip is to have safe clearance to the underside of the square stud as the keyboard clear link moves rearward. To adjust, form the blocking lip.

3. When the carriage clear key is depressed and the auxiliary clear key is latched down, the lobe on the clutch operating link is to move the disabling bellcrank downward, but not far enough to latch it on the release lever. To adjust, form the disabling bellcrank.

CARRIAGE SHIFT

ADJ. 1 - SHIFT GEAR CENTRALIZING AND UNLOCKING

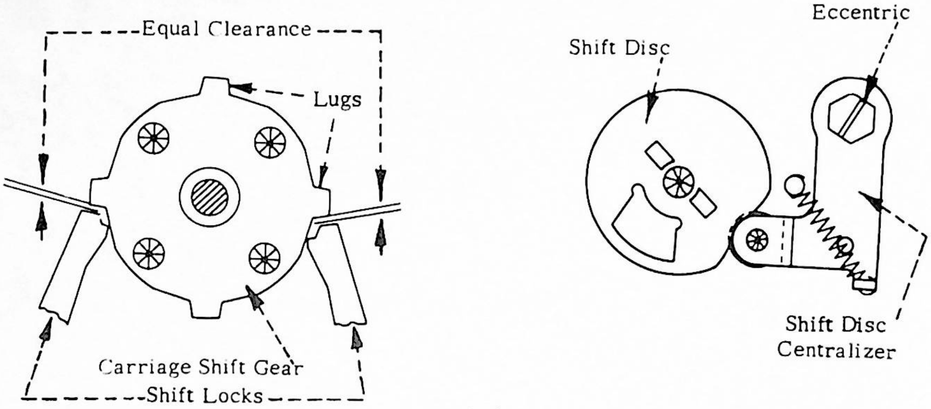


FIG. 1

FIG. 1 - SHIFT DISC CENTRALIZER

There is to be approximately equal clearance between the shift locks and the carriage shift gear lugs. To adjust, turn the eccentric on the shift disc centralizer. Then rotate the shift gear and check the clearance under each lug.

FIG. 2 - ADJUSTABLE SUPPORT

The shift locks are to be free to move in and out under the shift gear lugs with minimum clearance. To adjust, raise or lower the shift gear by rotating the support. Check the clearance on all four lugs.

Note: The support must be properly seated on the bearing plate, otherwise the adjustment will have no effect.

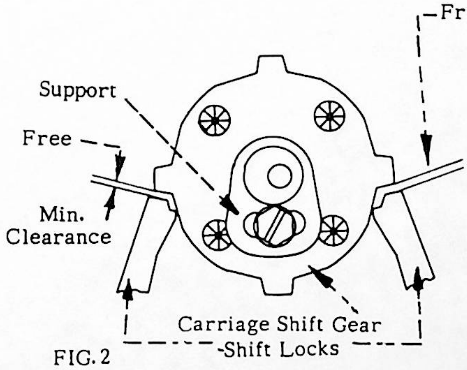


FIG. 2

Continued On Next Page

ADJ. 1 - SHIFT GEAR CENTRALIZING AND UNLOCKING (Cont.)

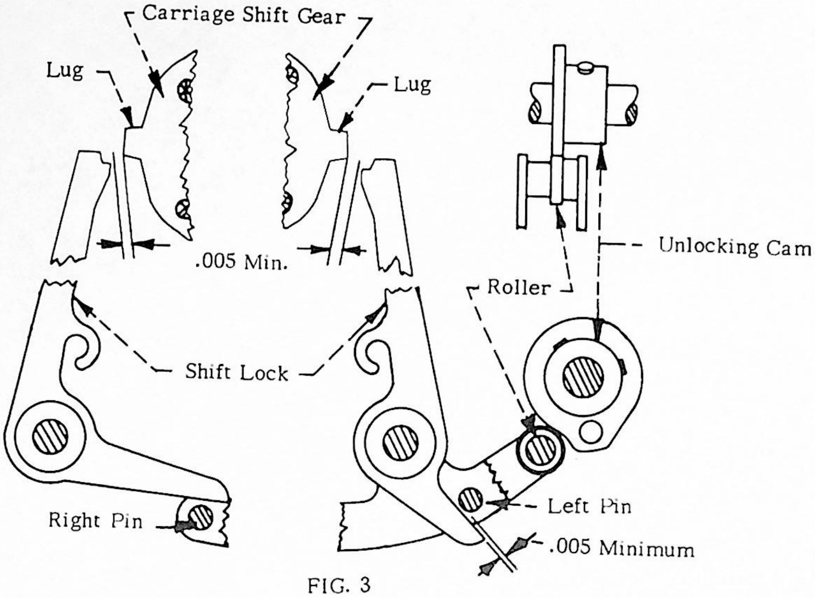


FIG. 3

FIG. 3 - UNLOCKING CAM

1. In a shift operation, the lugs on the carriage shift gear are to clear the shift locks with no less than .005" clearance.

2. When the left shift key is depressed, the left pin (left shift unlocking pin) is to move over the tail of the left shift lock with approximately .005" minimum clearance.

To adjust, position the unlocking cam on the large roller of the shift unlocking assembly and retard or advance the cam as required.

Note: Should the shift unlocking assembly bottom at its limit of travel, or if there is insufficient clearance for the left pin to pass the tail of the left shift lock, move the unlocking cam so it contacts the smaller diameter roller on the shift unlocking assembly.

FIG. 4 - RIGHT SHIFT LOCK

To insure a right shift in multiplication, there is to be .015" clearance between the right shift lock and the end of the right shift pin. To adjust, form the right shift lock.

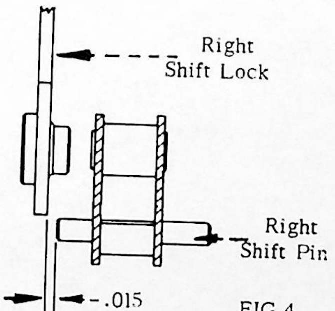


FIG. 4

ADJ. 2 - SHIFT ENGAGING AND DISENGAGING

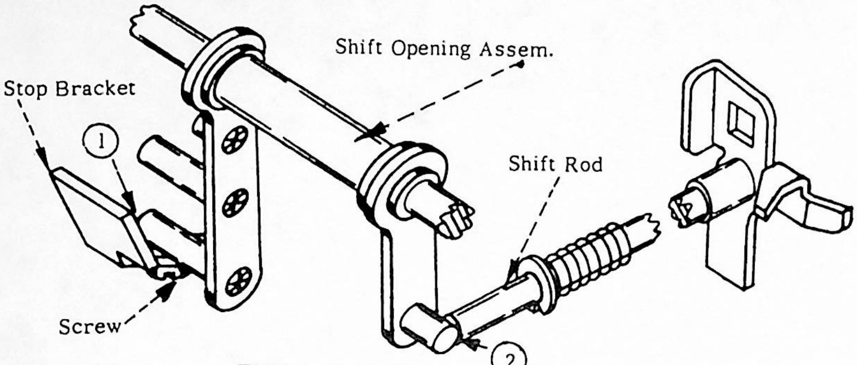


FIG. i

FIG. 1 - STOP FOR SHIFT OPENING ASSEMBLY

With the machine in home position, the shift opening assembly is to have minimum front to rear movement. (Minimum clearance between points 1 and 2.) To adjust, move the stop bracket.

FIG. 2 - SHIFT ENGAGING LINKS

With the machine in home position there is to be .003" to .005" clearance between the shift engaging link and the stud. To adjust, turn the eccentric as required. Adjust the other shift engaging link in the same manner.

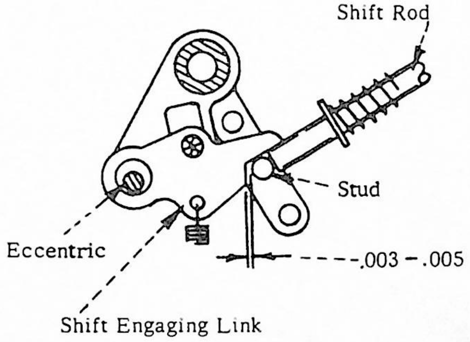


FIG. 2

FIG. 3 - SHIFT CLUTCH CONTROLLER

With the left shift key held fully depressed, the camming lip on the shift clutch controller is to clear the shift disc by .015" maximum. To adjust, form the camming lip. Adjust the right shift clutch controller the same way.

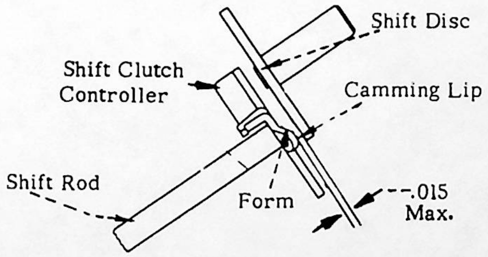


FIG.3

ADJ. 2 - SHIFT ENGAGING AND DISENGAGING (Cont.)

FIG. 4 - SHIFT DRIVER DISENGAGING

With the machine in home position, manually raise the shift clutch controller to engage the shift driver into the shift disc; then allow the shift clutch controller to restore. Next, release the main clutch and rotate the drive shaft by hand. Point 1 on the shift driver is to disengage from the shift disc and have .015" clearance from the shift disc. To adjust, form the disengaging tail outward. Test each shift driver (right and left shift and carriage clear).

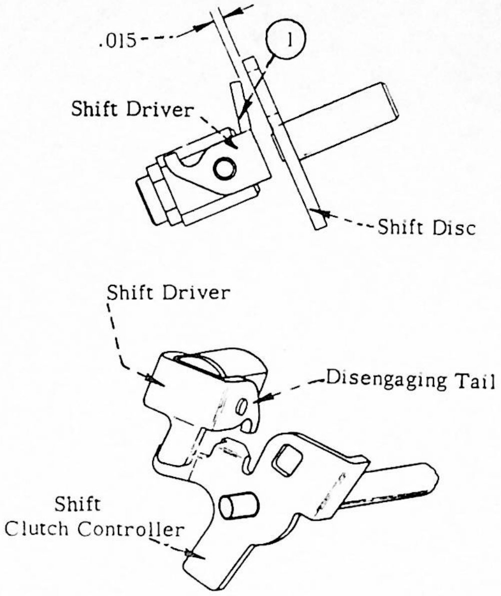


FIG. 4

FIG. 5 - SHIFT INTERLOCK

With a shift key held depressed and the drive shaft half cycled, there is to be no pressure and no clearance to the right and left shift clutch controllers. To adjust, form the interlock bracket in or out as required.

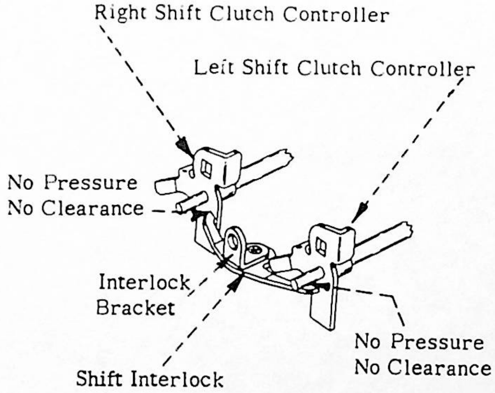
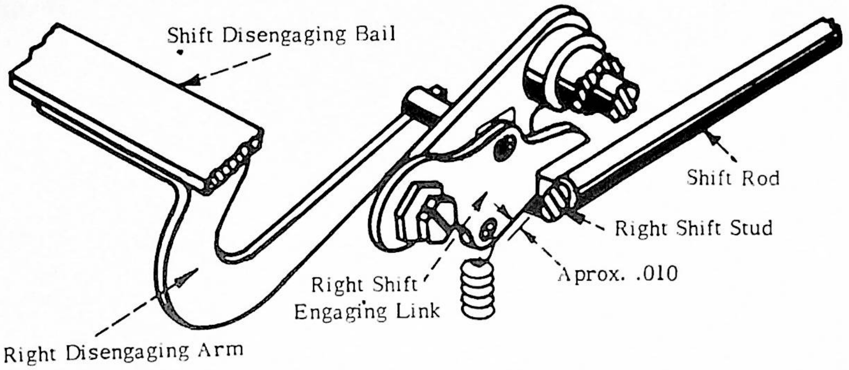
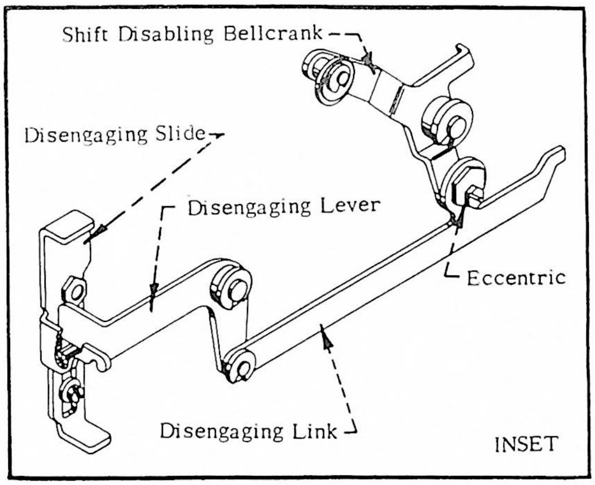


FIG. 5

ADJ. 3 - RIGHT SHIFT DISABLING

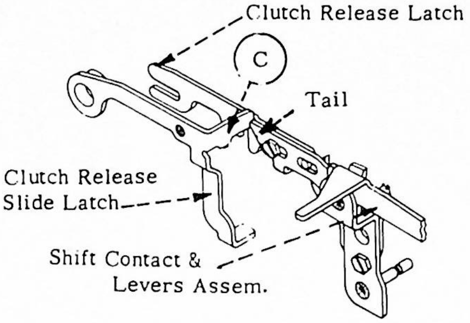




With the right shift key held depressed and the carriage shifted to the extreme right, the first override action is to stop the carriage shift and raise the right shift engaging link approximately .010" off the right shift stud. To adjust, turn the eccentric on the disengaging link as shown in the Inset. After adjusting, check to see that the shift engaging link drops freely over the right shift stud. Then recheck Adj. 8, Page 8-7 (Tab Shift Delatching on Override).

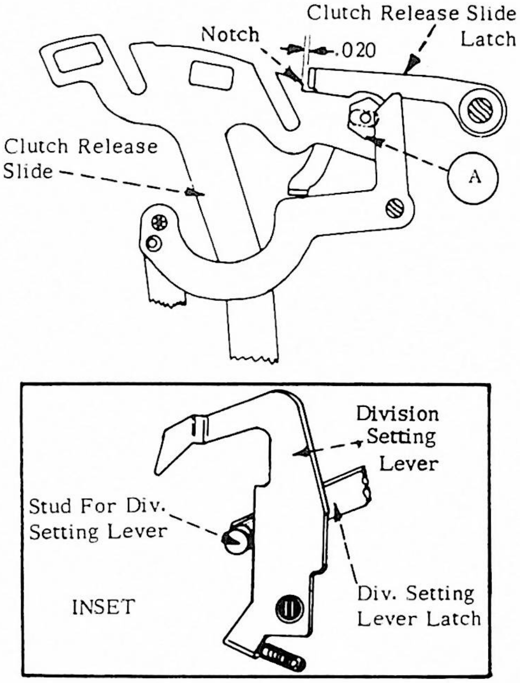
ADJ. 1 - ENGAGEMENT OF THE CLUTCH RELEASE SLIDE LATCH

With the machine running under power in division (keyboard repeat key to the rear), Lip C is to engage the front edge of the tail on the shift contact and levers assembly and prevent the tail from bouncing. To adjust, form the end of lip C.



ADJ. 2 - OVERLATCH OF THE CLUTCH RELEASE SLIDE LATCH

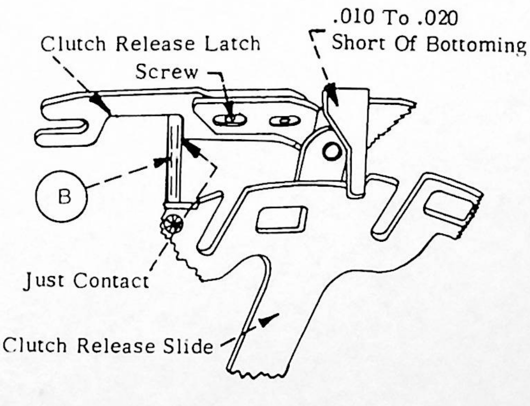
With the division setting lever delatched as shown in the Inset, there is to be .020" clearance between the clutch release slide latch and the edge of the notch on the clutch release slide. To adjust, move stud A.



ADJ. 3 - CLUTCH RELEASE LATCH

With the division setting lever delatched as shown in the Inset, the clutch release latch is to just contact stud B. To adjust, move the clutch release latch forward or rearward as required.

Note: After adjusting as above, check to see that the lip on the clutch release latch is approximately .010" to .020" short of bottoming against the frame.



ADJ. 4 - CLUTCH RELEASING AND POWER SHIFT

Because so many factors effect clutch releasing and power shift, this adjustment has been arranged in fourteen steps that must be followed in the sequence as outlined.

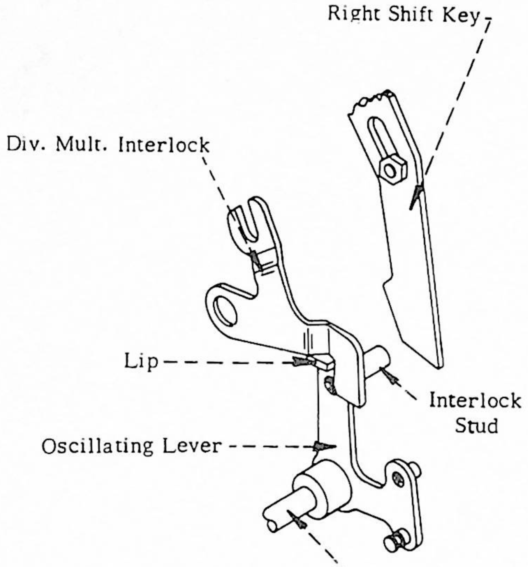


FIG. 1

FIG. 1 - HOME POSITION OF THE CLUTCH OPENING SHAFT

IMPORTANT! All of the following adjustment steps are dependent on the clutch opening shaft being in its home position. This is a MUST! Failure to check this home position after each adjustment step will result in having the machine improperly adjusted.

The home position of the clutch opening shaft can be checked as follows:

1. The division-mult interlock is to be free to rotate in and out of position behind the lip on the oscillating lever without catching or dragging on the lip.
2. Cycle the machine with the right shift key depressed and see that the key restores without catching or dragging on the interlock stud.

If it is found that the clutch opening shaft is not in its home position, check to find the cause for the restriction before continuing with the adjustments.

ADJ. 4 - CLUTCH RELEASING AND POWER SHIFT (Cont.)

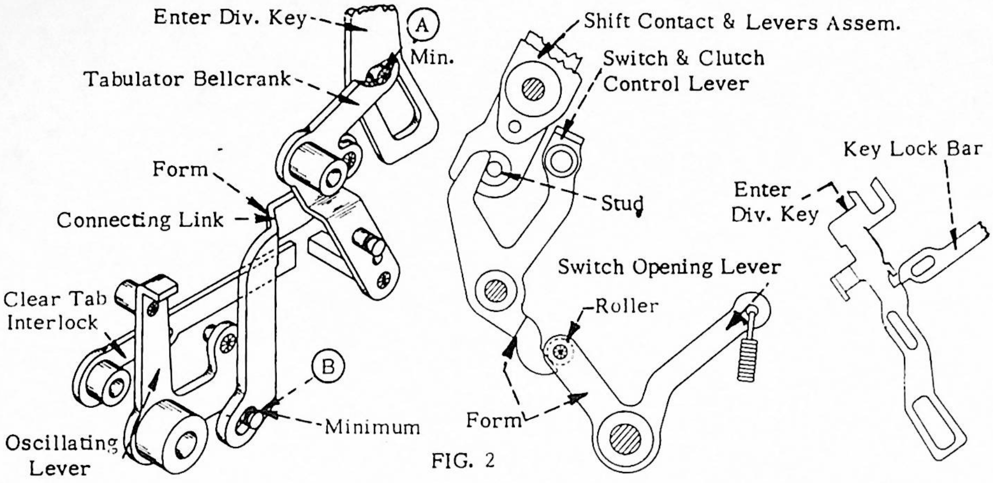


FIG. 2

FIG. 2 - CLUTCH RELEASE FOR ENTER DIVIDEND KEY

On a slow depression of the enter dividend key, the clutch is to release just as the key lock bar latches over the latch point on the key. To adjust: (1) Form the connecting link at the offset for minimum lost motion between the tabulator bellcrank and the oscillating lever as shown at points A and B. (Check by applying light pressure against the oscillating lever while partially moving the enter dividend key downward.) (2) Then form the switch opening lever or the switch and clutch control lever so the clutch releases just as the enter dividend key latches. Note: After adjusting as above, check to see that the enter dividend key is blocked by the clear tab interlock when the mult key is depressed.

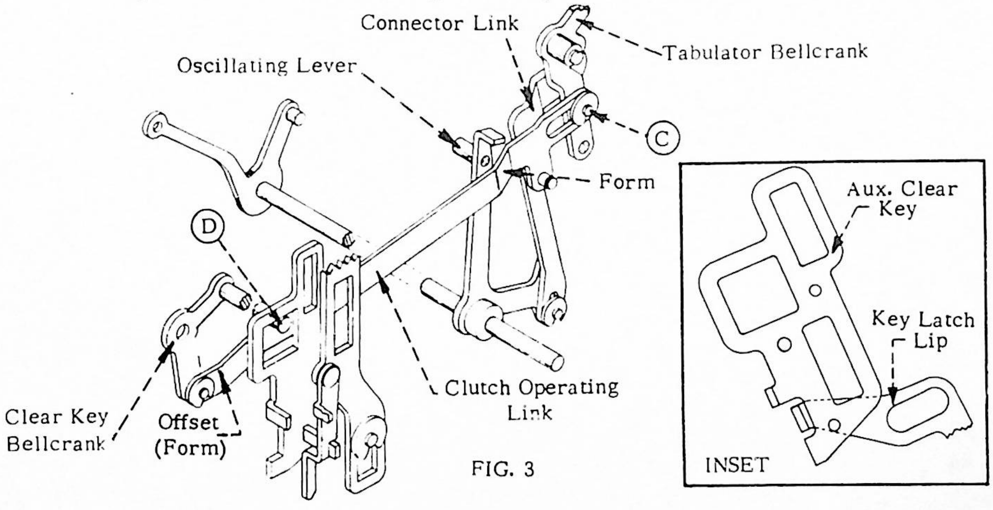


FIG. 3

FIG. 3 - CLUTCH RELEASE FOR CARRIAGE CLEAR

On a slow depression of the carriage clear key, the clutch is to release just as the auxiliary carriage clear key is latched by the key latch lip as shown in the inset. To adjust, form the clutch operating link at the offset. Then check to see that the parts are free and have a slight movement at points C and D.

ADJ. 4 - CLUTCH RELEASING AND POWER SHIFT (Cont.)

FIG. 4 - AUXILIARY CARRIAGE CLEAR KEY RELEASE

With the carriage clear key held depressed, cycle the drive shaft until the stud on the back transfer restore cam is at its high point of movement with the clear delatching arm. At this point: the bumper is to just contact the stud on the clear delatching arm and the auxiliary carriage clear key is to be released from the auxiliary key actuator. To adjust, form the upper end of the clear delatching arm at point indicated. Then move the bumper so it just contacts the stud on the clear delatching arm.

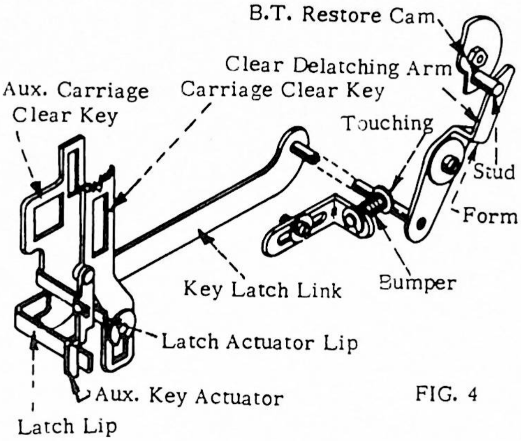


FIG. 4

FIG. 5 - MULT KEY LATCHES

The latch lips on the mult key latches are to be parallel to the mult keyboard top plate and aligned with each other so they have equal engagement with the mult keys. To adjust, form the latch lips as required. Note: Once the latches are properly adjusted, do not change them as this will effect the latching point for the clutch release.

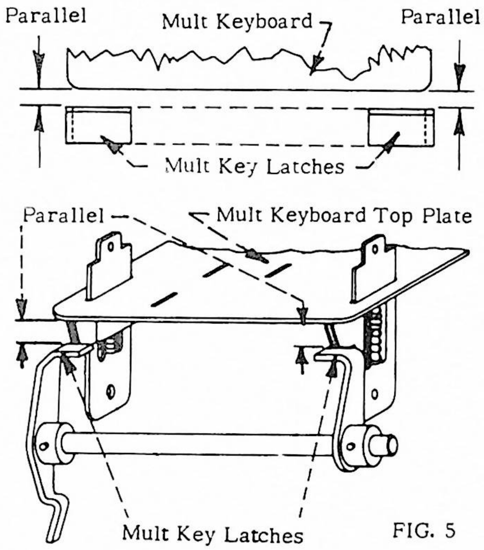


FIG. 5

FIG. 6 - MULT-SQ. KEY RELEASE

With the machine in home position, the spring connected between the release link and the key release bellcrank is to hold enough tension on the connecting parts so the key release link is just touching stud A. To adjust, rotate the release link on its shaft.

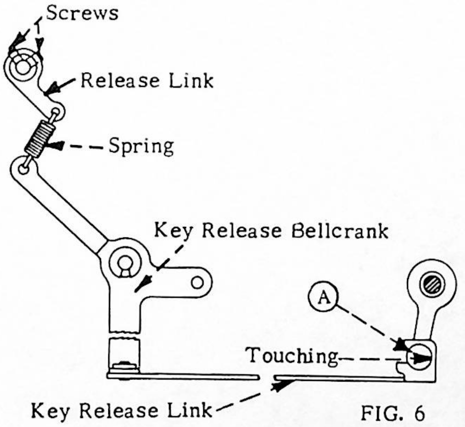


FIG. 6

ADJ. 4 - CLUTCH RELEASING AND POWER SHIFT (Cont.)

FIG. 7 - CLUTCH RELEASE FOR MULT CLEAR KEY

1. When the mult clear key is depressed and latched, the shift drum tooth is to have approximately a 75% engagement with the unit shift rack. To adjust, form the correction lever at the offset.

2. On a slow depression of the mult clear key, the clutch is to release just as the keylatch moves over the latch lip on the key. To adjust, form the correction clutch opening lever at point shown.

NOTE: The shift drum engagement is to be adjusted before adjusting the clutch release.

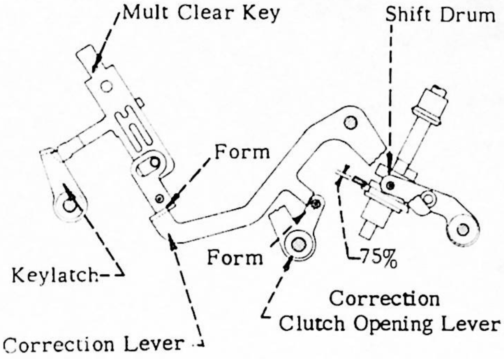


FIG. 7

FIG. 8 - CLUTCH RELEASE FOR THE MULT KEY

When the mult key is depressed, the clutch is to release just as the keylatch moves over the latch lip on the keystem. To adjust, turn the eccentric on the clutch opening arm.

Note: When adjusting the eccentric it may be found that the mult key interlock is too close to the lip on the accum. mult clutch opening link (see Fig. 9, page 4-6). If so it will be necessary to back off on the eccentric adjustment and form the clutch release bellcrank to obtain the proper mult clutch release.

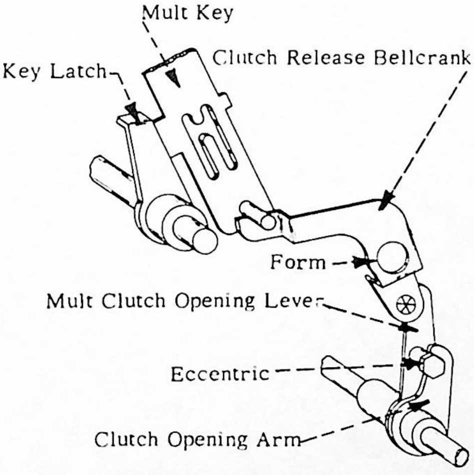


FIG. 8

ADJ. 4 - CLUTCH RELEASING AND POWER SHIFT (Cont.)

FIG. 9 - CLUTCH RELEASE FOR ACCUM MULT KEY

When the accum mult key is depressed, the clutch is to release just as the keylatch moves over the latch lip on the keystem. To adjust, turn the eccentric on the accum and neg mult clutch release link.

Note: No clutch release adjustment is required for the negative multiply key. It will operate properly even though its clutch release is slightly off in relation to the accum. mult. key.

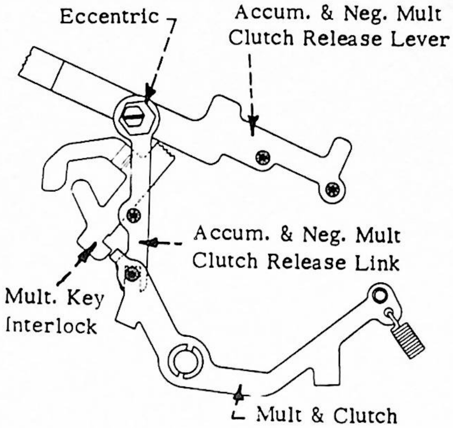

Eccentric
Accum. & Neg. Mult Clutch Release Lever
Accum. & Neg. Mult Clutch Release Link
Mult. Key Interlock
Mult & Clutch Set-Up Lever

FIG. 9

FIG. 10- RESTORE OF CLEAR ENGAGING LINK (Mult Clear)

With the machine in home position; the clear engaging link is to be fully engaged on the clear shift rod, and the lower leg on the clear actuator arm is to just contact the stud on the correction lever. To adjust: (1) Keep the clear disabling shaft rotated so the stud on the clear disabling arm is against the mult clear disabling bellcrank. Then rotate the clear actuator arm so it contacts the stud on the correction lever and tighten the set-screws. (2) Form the clear disabling lever for full engagement of the clear engaging link, but with no lost motion in the parts.

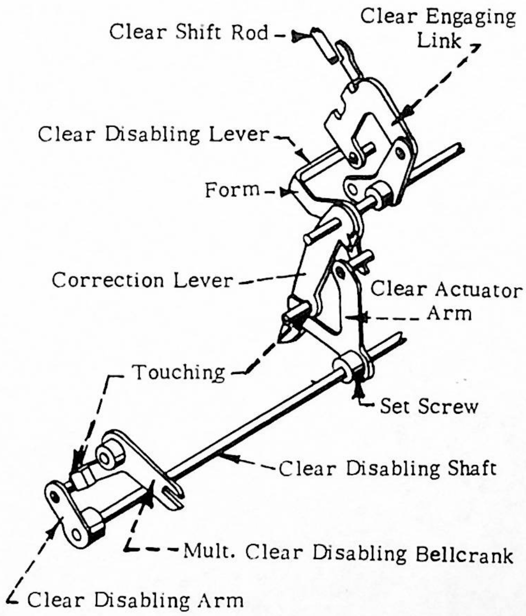


FIG. 10

Continued On Next Page

ADJ. 4 - CLUTCH RELEASING AND POWER SHIFT (Cont.)

FIG. 11 - INITIAL POSITIONING OF THE SHIFT OSCILLATING LEVER

With the clutch manually released, cycle the drive shaft until the lip on the shift actuating lever is at its closest point to the stud on the shift oscillating lever. At this point, the shift actuating lever is not to pick-up the shift oscillating lever, but have approximately .020" clearance. To adjust, form the shift actuating control lever.

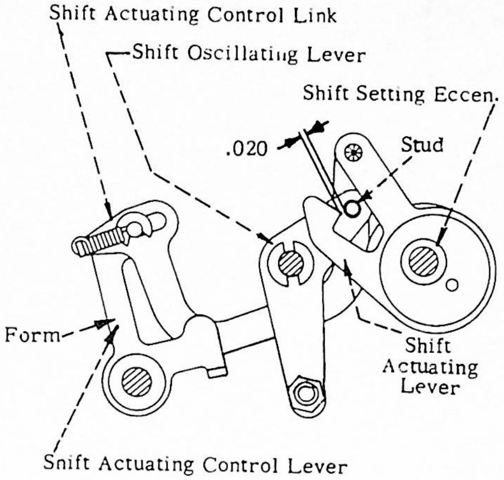


FIG. 11

FIG. 12 - OVERLATCH OF SHIFT OSCILLATING LEVER

With the mult key depressed, cycle the drive shaft until the shift actuating lever is at its high point of movement. At this point, there is to be .003" to .005" clearance between the oscillating latch and the eccentric stud. Also, the latch is to rest on the eccentric stud and contact lip "B". To adjust, turn the eccentric stud (keeping the high point down), and then raise or lower the latch by forming the lip B. After adjusting cycle the machine in enter dividend and check for the same conditions as above.

NOTE: At the time the shift actuating lever is at its high point of movement, check to see that the auto clear lever shaft is not bowed due to the engaging links being bottomed.

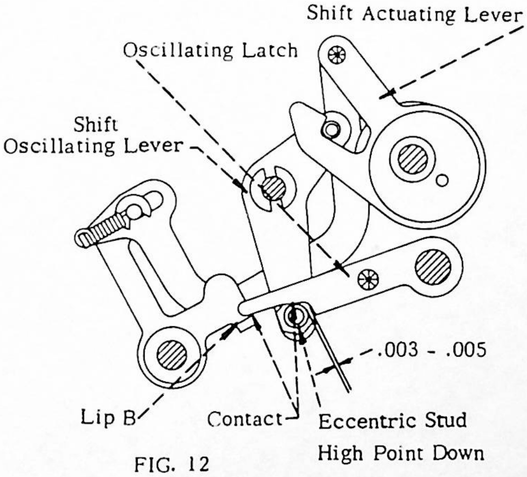


FIG. 12

ADJ. 4- CLUTCH RELEASING AND POWER SHIFT (Cont.)

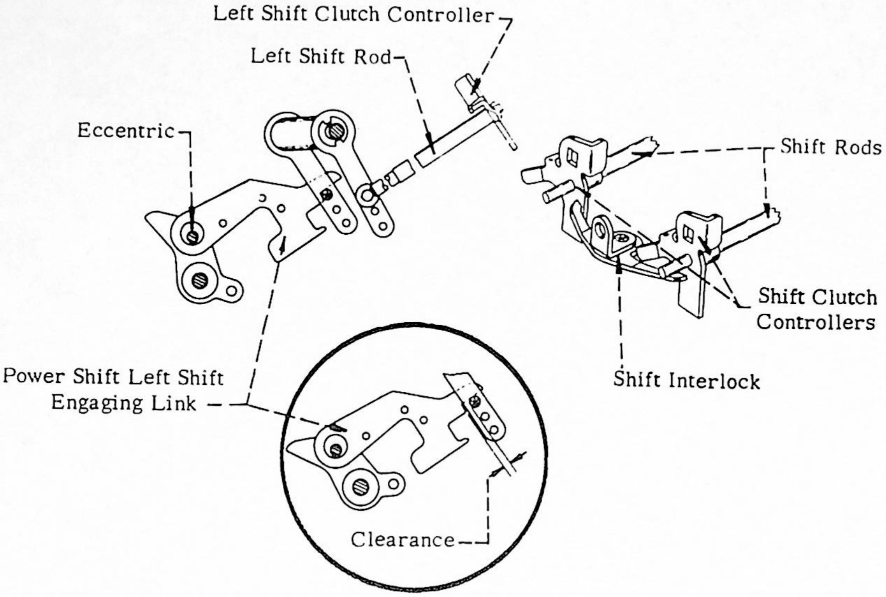


FIG. 13

FIG. 13 - POWER-SHIFT LEFT-SHIFT-ENGAGING-LINK

With the power-shift left-shift-engaging-link at its high point of movement, the left shift rod is to be positioned fully rearward, but the shift clutch controller is not to bottom against the shift interlock. To adjust, turn the eccentric on the power-shift left-shift-engaging link. After adjusting and with the machine restored to home position, check to see that the power-shift left-shift-engaging-link drops freely over the stud on the shift opening assembly.

FIG. 14 - DISABLING THE KEYBOARD CLEAR LEVER LINK

With the keyboard repeat key to the rear, cycle the machine in multiplication and then enter dividend. For either operation, the keyboard clear lever link is to clear the underside of the pendant clear bellcrank stud. To adjust, form the clear link release lever at points 1 and 2 for the key that depresses the keyboard clear lever link the least.

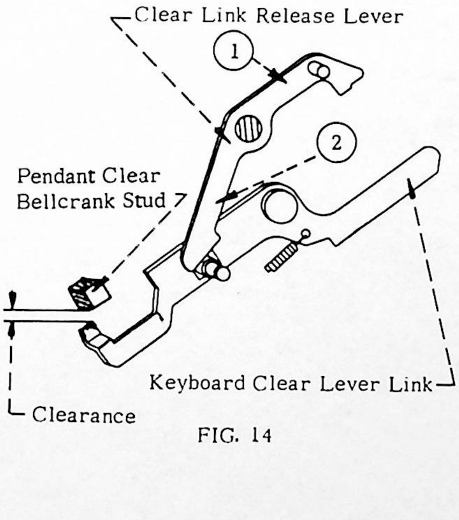


FIG. 14

ADJ. 1 - ACCUMULATOR DIAL CLEAR RACKS

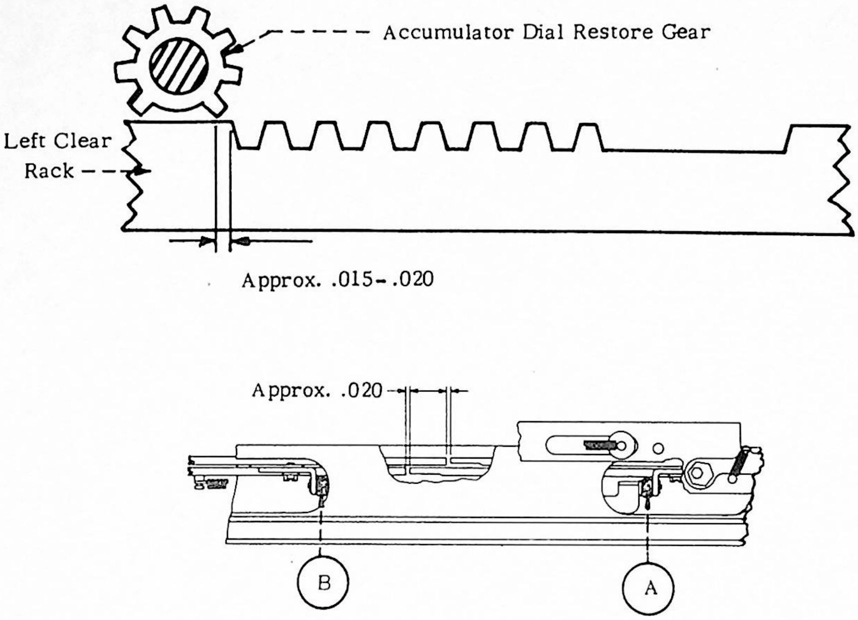


FIG. 1

FIG. 1 - LEFT CLEAR RACK OVERTRAVEL & CLEARANCE BETWEEN RACKS

1. When the left of split accumulator dials are cleared to zero, the left clear rack is to overtravel approximately .015" to .020" and block the rebound of the dials. To adjust, move bumper A against the left rack end stop.

2. With the right clear rack held in its restored position (right optional clear knob rotated to prevent clearing) and the left clear rack moved as far to the right as possible (clear position), there is to be approximately .020" clearance between the ends of the right and left racks. To adjust, move bumper B as required.

Continued on Next Page

ADJ. 1 - ACCUMULATOR DIAL CLEAR RACKS (Cont.)

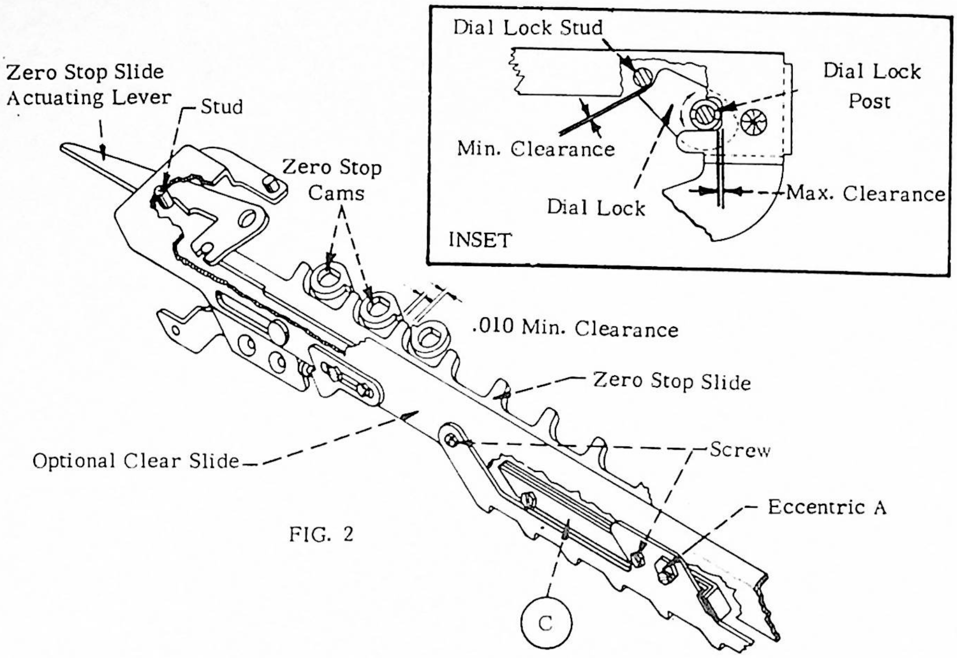


FIG. 2

FIG. 2 - OPTIONAL CLEAR SLIDE CLEARANCE TO DIAL LOCK POST

With both accumulator dial clear racks in their restored (home) position, there is to be maximum clearance between the clear post and the optional clear slide as shown in the Inset. Also, the dial lock is to be free to move on and off the dial lock stud with minimum clearance. To adjust, move bumper C (leaf spring bumper) right or left as required. After adjusting as above, check for .010" minimum clearance between the zero stop slide and the tips on two adjacent zero stop cams.

FIG. 3 - SPLIT CLEAR LATCH

With the clear racks in their restored position, and the eccentric A turned so its high side is pointed to the left as shown in the Inset, the split clear latch is to be centered on the ear on the end of the left clear rack. To adjust, move the inside bumper D against the end of the left clear rack as required.

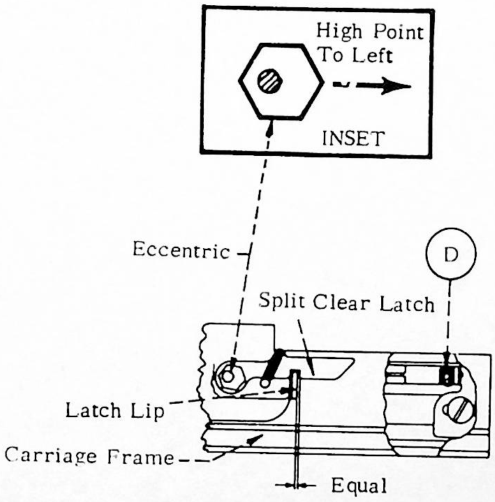
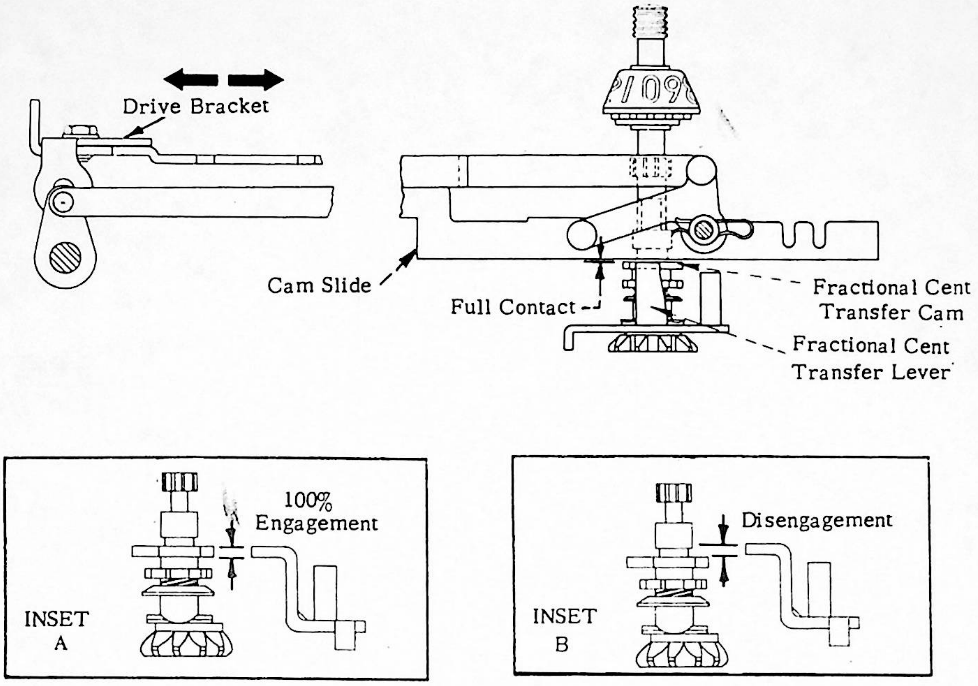


FIG. 3

ADJ. 2 - FRACTIONAL CENT TRANSFER LEVERS



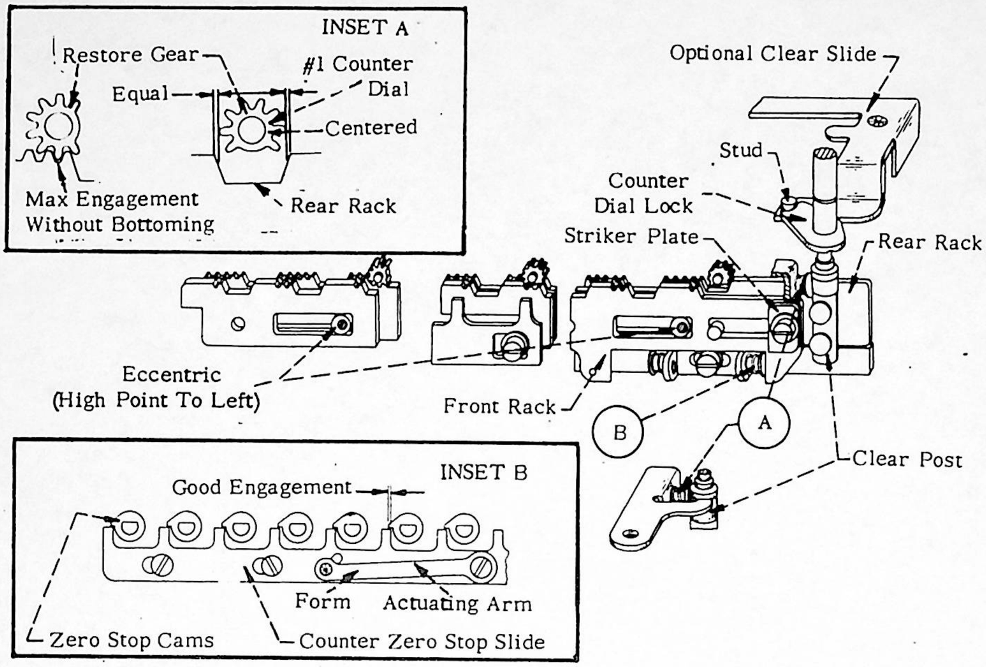
1. During normal operation the fractional cent transfer levers are to have 100% engagement with the fractional cent transfer cams as shown in Inset A.

2. During carriage clear, the fractional cent transfer cams must have safe clearance to the fractional cent transfer levers as shown in Inset B.

To adjust for both conditions, move the drive bracket right or left as required.

Note: When checking this adjustment, pull the optional clear slide to move the clear rack. DON'T PULL THE CLEAR RACK TO MOVE THE OPTIONAL CLEAR SLIDE.

ADJ. 3 - COUNTER CLEAR RACKS & ZERO STOP SLIDE



1. With the front and rear counter clear racks in home position, the counter dial restore gears are to be centered in the cut-out sections on the rear counter clear rack. To adjust, loosen the bumper A and position the rear rack so the #1 counter dial restore gear is centered in the cut-out as shown in Inset A.

   Then move the bumper against the clear rack and tighten the screw.
2. With the clear racks in home position, the leading edge of the first tooth on the front rack is to be aligned with the leading edge of the first tooth on the rear rack. To adjust, move bumper B.

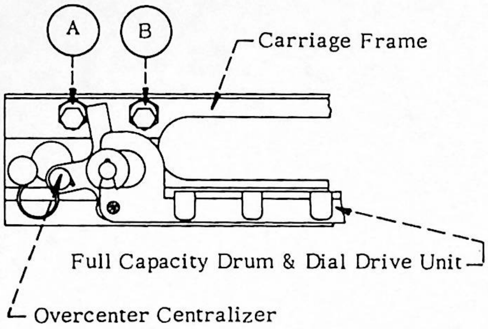
Note: After adjusting the racks as above, check to see that the counter dial lock is free to move on and off the clear stud without binding.

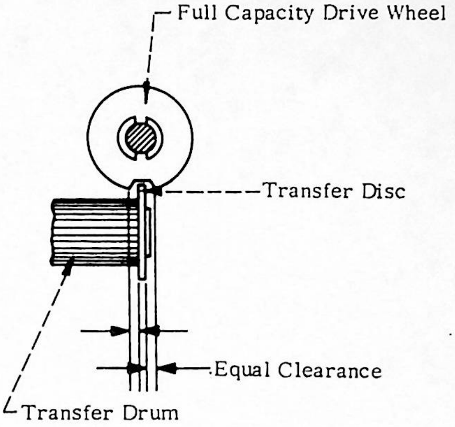
3. With a "9" in the #1 counter dial, slowly pull the counter clear post to the right so the rear rack engages the restore gear and begins to rotate the dial to zero. Then as the front rack is picked up and begins to move, the single tooth on the front rack is to move into mesh with the restore gear without binding. To adjust, move the striker plate.
4. When the counter dials are being cleared, the clear rack teeth are to have a good engagement with the restore gears as shown in Inset A, but are not to bottom or cause any binding. To adjust, raise or lower the clear racks by turning the right or left eccentric studs.

Note: Keep the high point of the eccentrics to the left.

5. When the counter clear rack is moved to the right, there is to be a good engagement of the counter zero stop slide to the stop cams on the dials. To adjust, form the actuating arm by twisting it at point shown.

ADJ. 4 - ENGAGEMENT OF THE TRANSFER DISCS



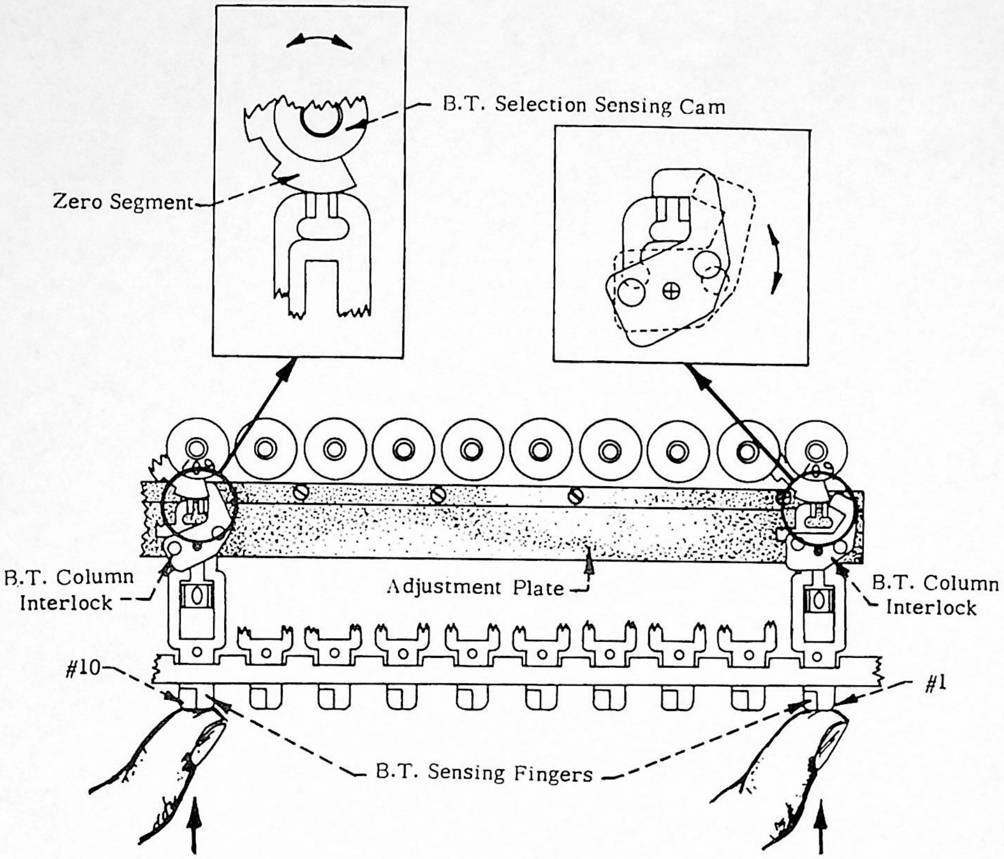


1. With the full capacity drum and dial drive unit to the right (minus position) and the accumulator dials at "0", rotate the #1 sector gear so all the transfer discs are engaged in the notches on the full capacity drive wheels. The transfer discs are to be centered in the drive wheel notches with equal side clearance. To adjust, turn the eccentric A. (Note: The side clearance can be felt by rotating the dials back and forth.)

2. With the full capacity drum and dial drive unit to the left (plus position) and the accumulator dials turned to a "9". rotate the #1 sector gear so all the transfer discs are engaged in the notches on the full capacity drive wheels. The transfer discs are to be centered in the drive wheel notches with equal side clearance. To adjust, turn the eccentric B. Check side clearance as above.

CARRIAGE & CARRIAGE CLEAR

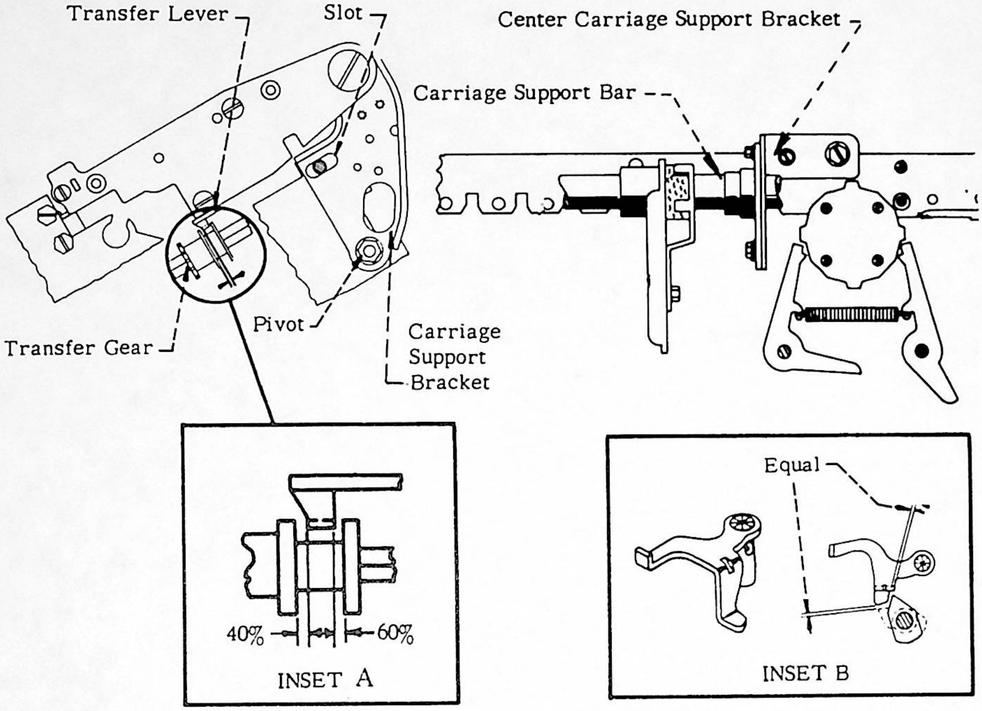
ADJ. 5 - BACK TRANSFER COLUMN INTERLOCKS



When the back transfer column interlocks are turned to the lock position, the back transfer sensing fingers are to be blocked the same as if the dials were at zero. To adjust:

1. Have the accumulator dials at zero.
2. Push the #1 sensing fingers against the zero segment on the back transfer selection sensing cam.
3. While pushing against the ends of the #1 sensing fingers, move the adjustment plate rearward until the back transfer column interlock and the zero segment on the dial cam, can be rotated into position behind the sensing fingers with equal ease as shown in the Insets.
4. Tighten the screws on the right half of the adjustment plate.
5. Repeat the same procedure on the #10 back transfer column interlock and tighten the screws on the left half of the adjustment plate.
6. Check the machine in back transfer to see that the column interlocks prevent a back transfer of any number from 1 to 9 in the accumulator dials.

ADJ. 6 - TRANSFER LEVER CLEARANCE & ALIGNMENT



Because the alignment of the carriage in the machine involves a number of conditions, it is important that the following adjustment sequence be carefully followed.

Before installing the carriage:

1. Check the alignment and free movement of the transfer levers.

2. Check the fractional cent transfer levers for approximately equal clearance to their transfer cams as shown in Inset B. To adjust, form the upper end of the fractional cent transfer levers.

3. With the carriage installed in the machine and in the closed position, the transfer levers are to have 40% clearance to the front and 60% clearance to the rear as shown in Inset A. To adjust, move the carriage forward or rearward by means of the carriage support brackets. Note: Start with the carriage to the extreme left and adjust the clearance on the right end; then shift the carriage to the extreme right and adjust the clearance on the left end. After adjusting both ends, check the clearance at the center with the carriage at the extreme right and left; and move the center support bracket in or out as necessary.

4. With the carriage installed, the bearing holes for the support brackets must be aligned so the support shaft slides freely through the bearing holes without binding or running in or out of alignment with the parallel clearance of the transfer levers. To adjust, twist the support brackets as required.

ADJ. 7 - FULL CAPACITY ALIGNMENT

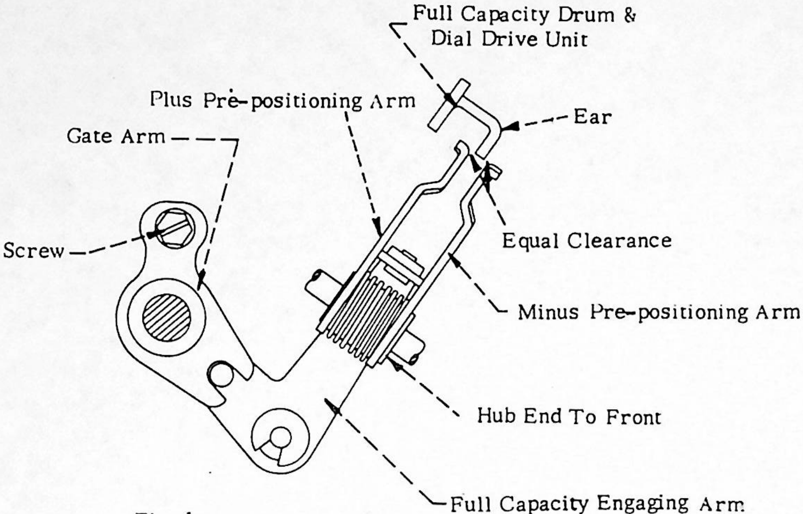


Fig. 1

FIG. 1 - PLUS & MINUS PRE-POSITIONING ARMS

As the carriage is shifted from side to side, the ears on the full capacity drum and dial drive unit are to pass between the plus and the minus pre-positioning arms with equal clearance. To adjust, loosen the screw on the gate arm and move the pre-positioning arms forward or rearward.

Note: When the add-subtract gate is in the plus or minus position, the pre-positioning arms are to have no less than 100% engagement with the ears.

FIG. 2 - FULL CAPACITY ENGAGING ACTUATOR

With the machine in home position, stud Z on the shift blockout arm is to have no more than .010" clearance to the lip on the full capacity engaging actuator. To adjust, form lip K on the full capacity engaging cam follower. Note: After adjusting, check to see that the stud moves freely over the lip without catching.

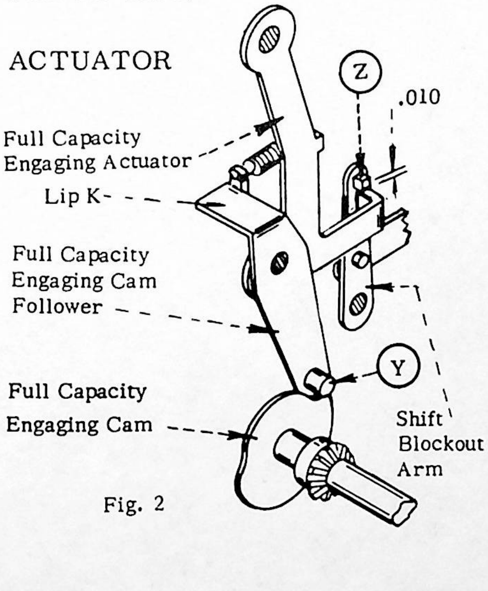
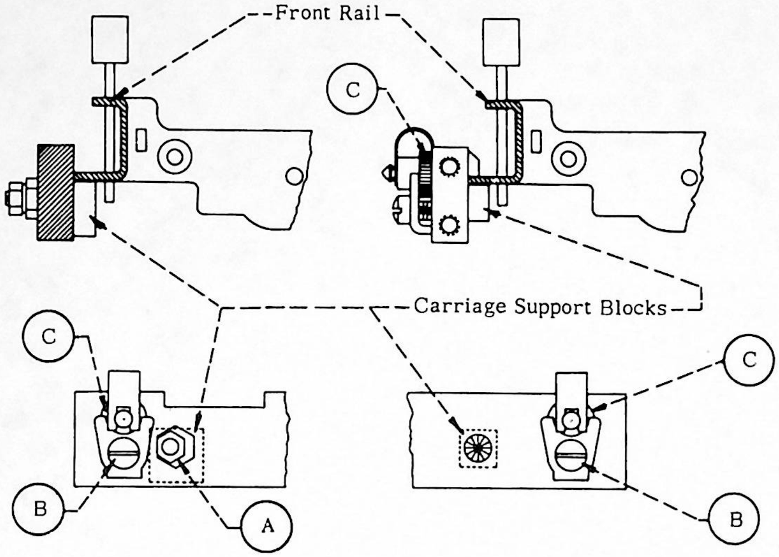


Fig. 2

ADJ. 8 - CARRIAGE FRONT LATCHES & SUPPORT BLOCKS



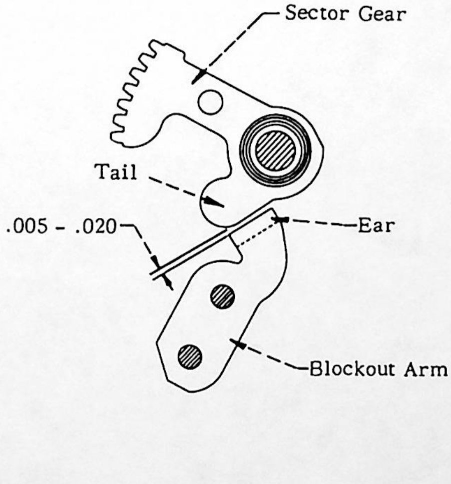
1. With the carriage in the center position, the carriage front rail is to rest on both support blocks. To adjust, raise or lower the left support block by rotating eccentric A.

2. When the carriage is latched down, the front rail is to have minimum up and down play. To adjust, loosen the screws B and raise or lower the front latches by rotating the eccentrics C.

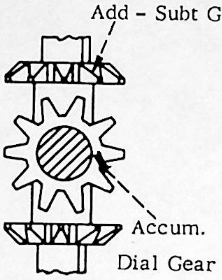
Note: The carriage can be opened from any carriage position. However, it should be closed only when the carriage is positioned to the extreme right. Failure to observe this will result in damage to the carriage.

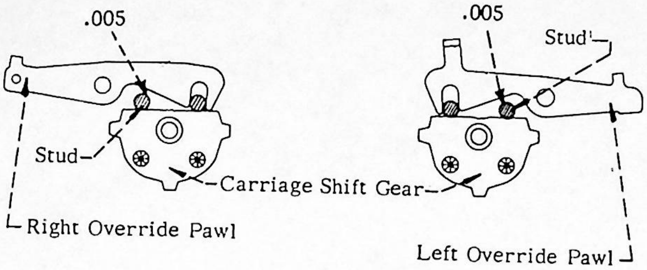
ADJ. 9 - SECTOR GEAR BLOCKOUT

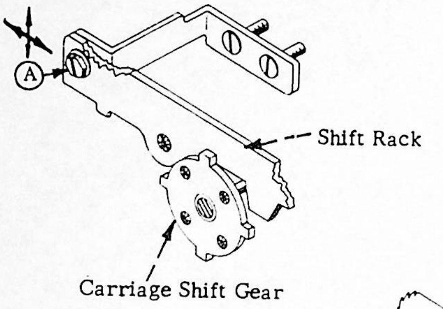
With the machine in home position and the carriage latched down, the ear on the blockout arm is to have .005" to .020" clearance to the sector gear tails. To adjust, form the ear on the blockout arm.

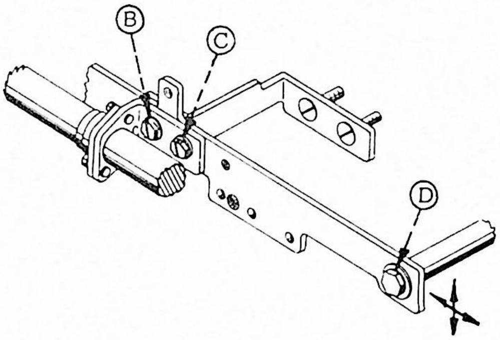


ADJ. 10 - CARRIAGE SHIFT RACK







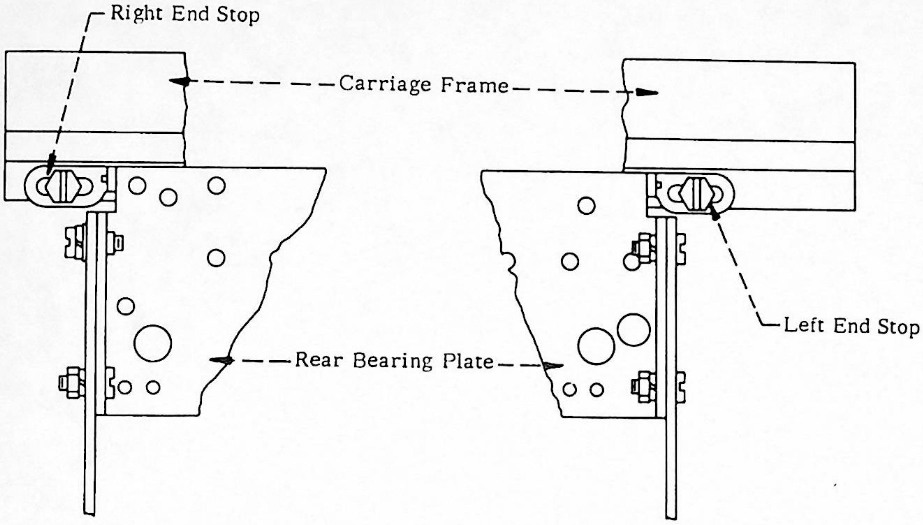


1. With the carriage shift rack engaged with the carriage shift gear and the carriage shifted out of home position, move the add-subtract gate from plus to minus. The add-subtract gears are to engage the accumulator dial gears with minimum movement (flicker).

2. With the carriage shifted to the left override position, and then to the right override position, check for approximately .005 clearance between the override pawls and the shift gear studs.

To adjust for both conditions. loosen the 4 screws designated as A-B-C and D and move the shift rack right or left and up and down as required.

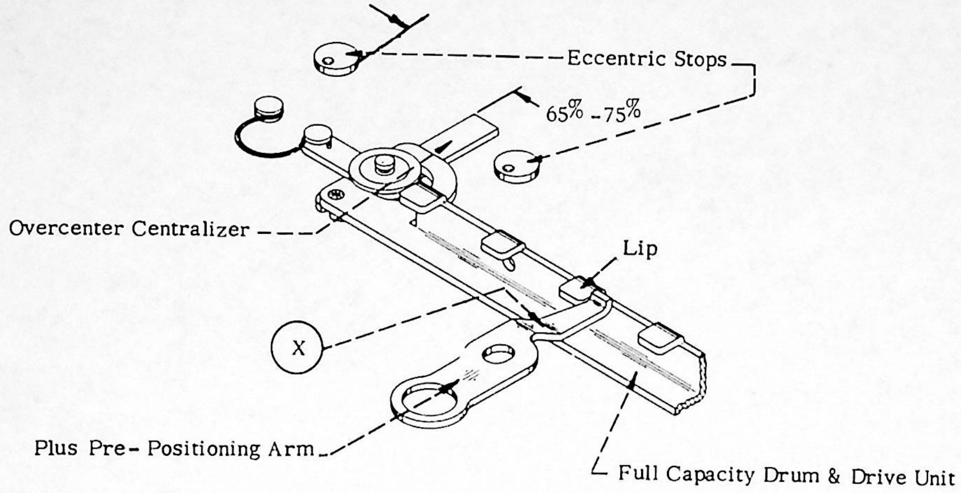
ADJ. 11 - CARRIAGE END STOPS

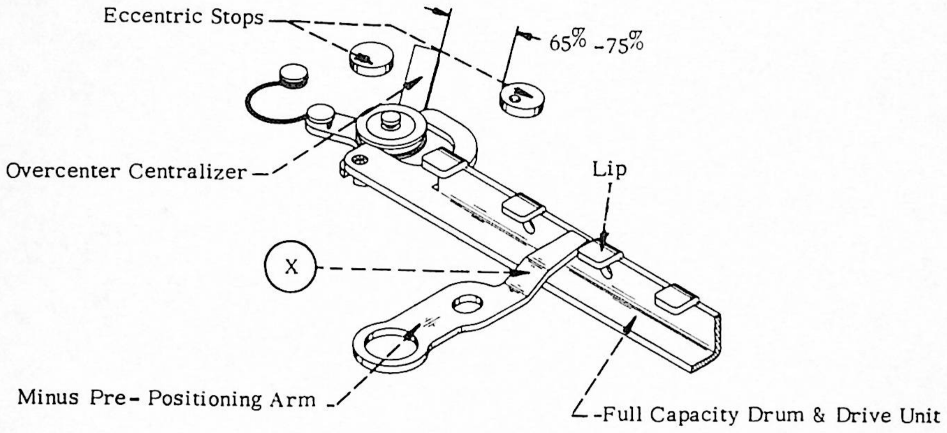


When the carriage is shifted to either the extreme right or the extreme left, the right and left end stops are to have minimum clearance to the back bearing plate and the carriage shift gear is to be fully centralized. To adjust, move the end stops as required.

To check, operate the machine by crank in right and left shift to see that the shift gear lugs do not drag or bind when the carriage shifts out of the left or right override positions. Also that the override pawl repositions itself to the shift gear.

ADJ. 12 - FULL CAPACITY DRUM & DIAL DRIVE UNIT



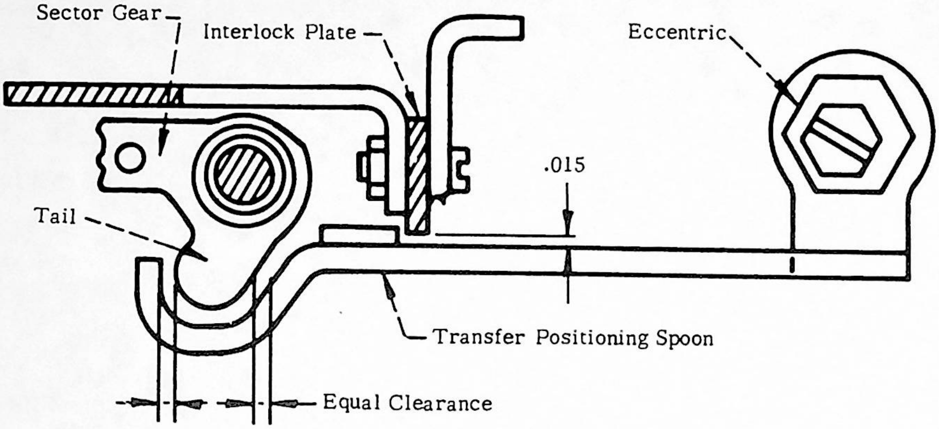


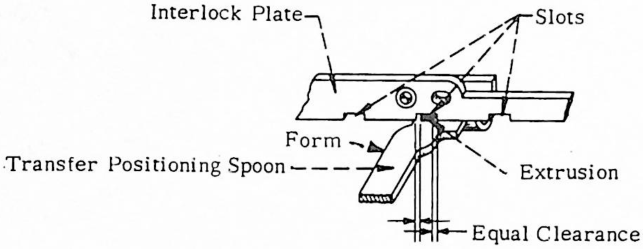
With the carriage shifted two positions to the right of home; and the over-center centralizer fully detented, apply light pressure opposing the movement of the full capacity drum and drive unit while manually cycling the machine in plus and minus.

The pre-positioning arm being operated is to move into engagement with the lip on the full capacity drum and drive unit and move the over-center centralizer 65% to 75% of its full travel. To adjust, form the pre-positioning arm requiring adjustment at point X.

Test under power the same way.

ADJ. 13 - TRANSFER POSITIONING SPOON



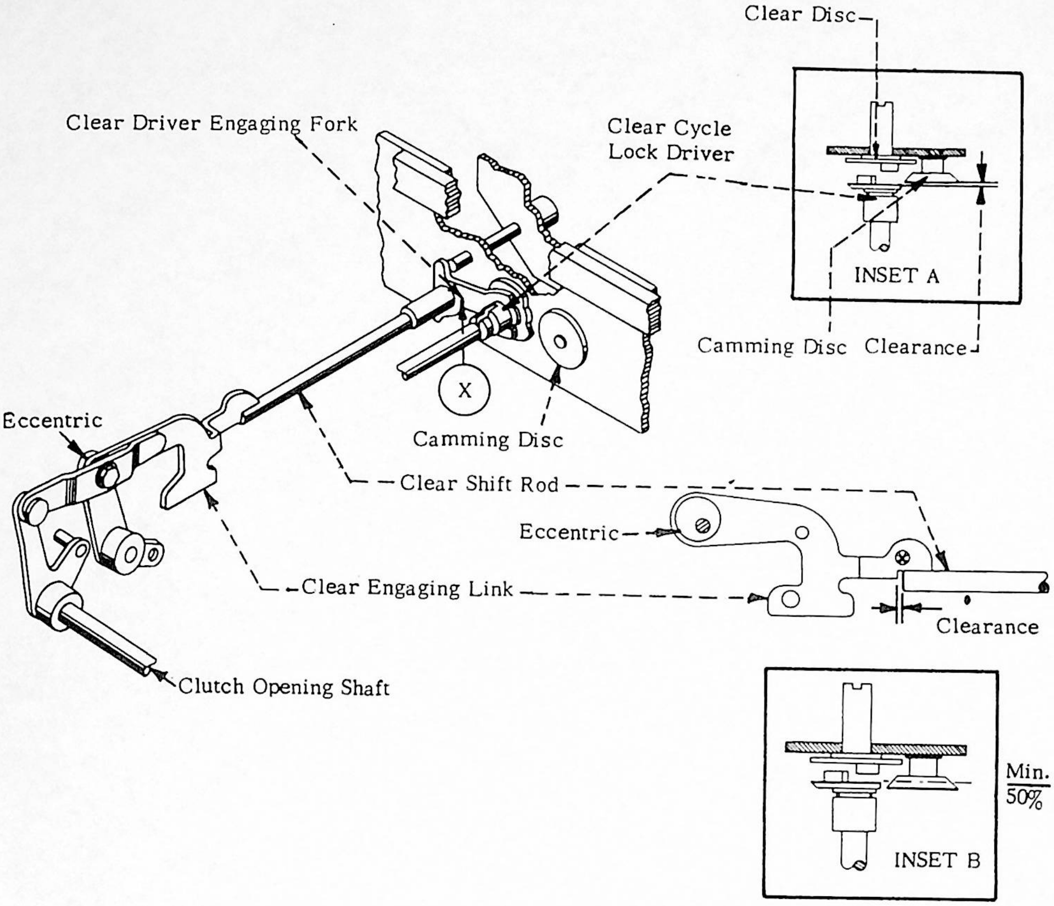


1. With the machine in home position, the tails on the sector gears are to be centered in the "U" of the transfer positioning spoon. To adjust, rotate the eccentric. Check the clearance of the sector gear tails in the "U" while the carriage is shifting.

2. With the carriage closed and latched, the transfer positioning spoon is to have .015" clearance to the interlock plate. To adjust, form the transfer positioning spoon at point shown.

3. With the carriage in any shift position, the extrusion on the transfer positioning spoon is to be centered in the slot on the interlock plate. To adjust, move the interlock plate right or left as required.

ADJ. 14 - CLEAR CYCLE LOCK DRIVER

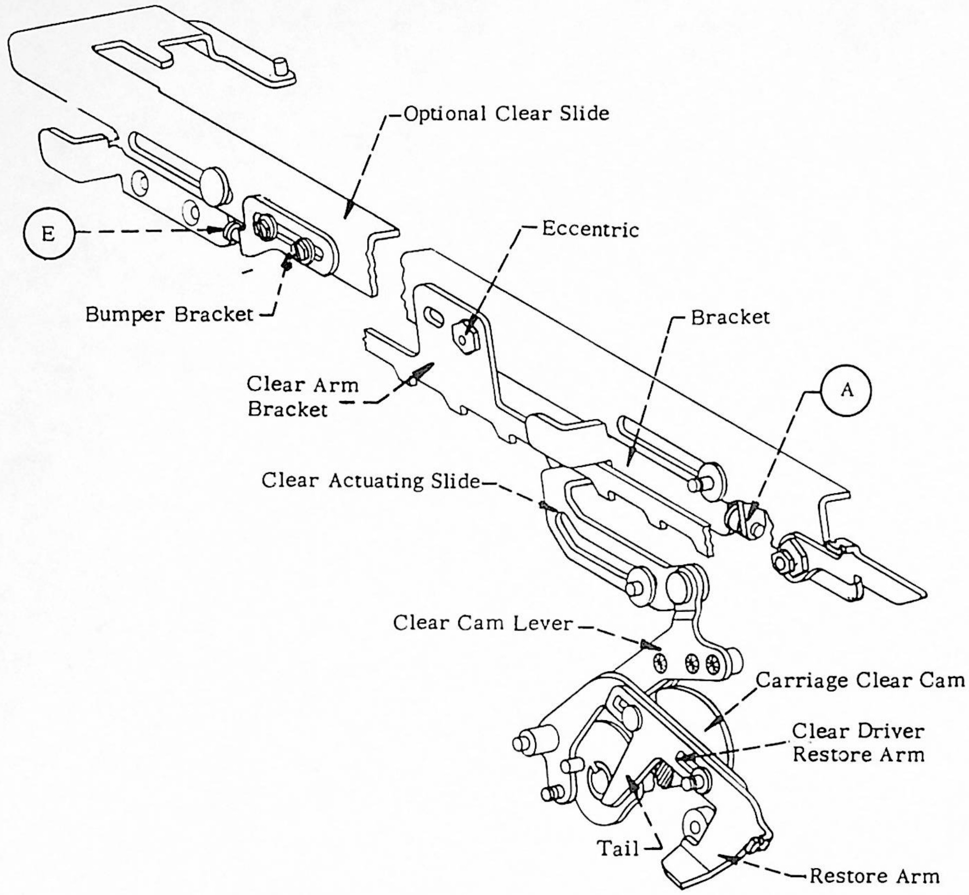


1. With the machine in home position, the clear cycle-lock driver is to have clearance to the camming disc as shown in Inset A. If necessary to adjust, form the clear driver engaging fork at point X.

2. With the machine in home position and the power cord pulled out, depress the carriage clear key. The clear cycle lock driver is to move rearward far enough so its rear edge is approximately in-line with the center of the camming disc or a 50% minimum engagement, as shown in Inset B. To adjust, turn the eccentric on the clear engaging link. When the drive shaft is cycled, the camming disc is to pull the clear cycle lock driver rearward for a 100% engagement. If it doesn't, then readjust the eccentric.

After adjusting and the machine is in home position, check to see that the clear engaging link has clearance to the end of the clear shift rod.

ADJ. 15 - OPTIONAL CLEAR SLIDE BUMPERS

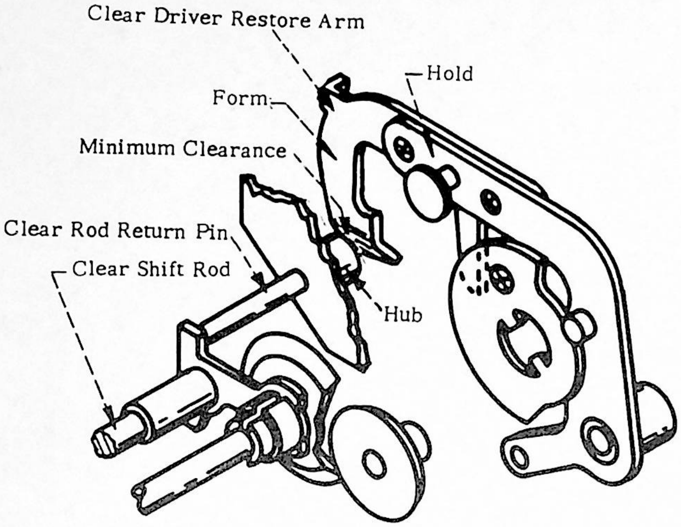


With the carriage clear cam on its high point of movement so the optional clear slide is actuated to the extreme right, the bumpers A and E are to contact their respective stops. To adjust bumper A, loosen the screws on the clear arm bracket and turn the eccentric.

To adjust bumper E, move the bumper bracket until the bumper rests against its stop.

Note: After adjusting the eccentric for bumper A, recheck adjustment 1, Figures 2 & 3, this section.

ADJ. 16 - CLEAR DRIVER RESTORE ARM



With the machine in home position, raise and lower the clear driver restore arm. There is to be minimum clearance between the restore arm and the hub for the clear rod return pin. To adjust, form the lower end of the restore arm. Check by cycling the machine in carriage clear and see that the pin is fully restored when the restore arm drops.

Note: To prevent binding the slotted portion of the clear driver restore arm, use a forming tool to hold the top of the arm while forming the lower end.

ADD-SUBTRACT GATE

ADJ. 1 - ALIGNMENT OF ADD-SUBTRACT GEARS TO ACCUM. DIALS

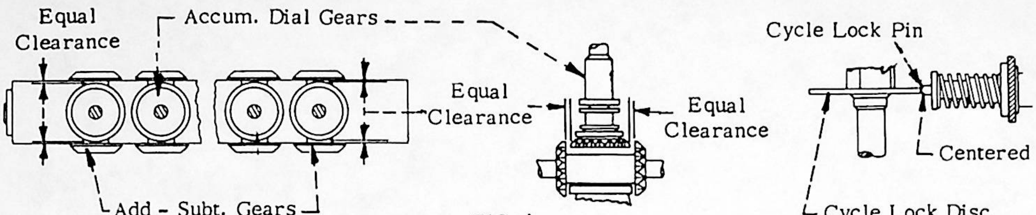


FIG. 1

FIG. 1 - ADD-SUBTRACT GATE & CYCLE LOCK PIN

With the machine in home position, the add-subtract gears are to have equal clearance to the accumulator dial gears and the cycle lock pin is to be centered on the outer edge of the cycle lock disc.

To adjust:

FIG. 2 - GATE ALIGNMENT (Right End)

Move the gate centralizer on the right end of the add-subtract gate so the accumulator dial gears are centered between the add-subtract gears.

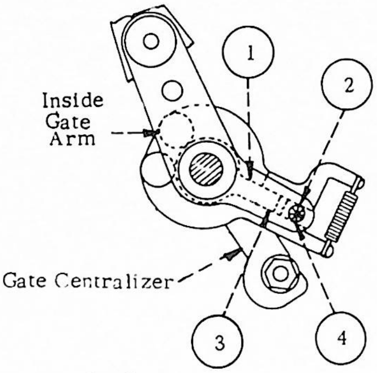
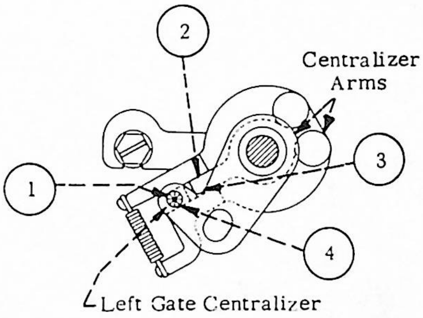


FIG. 2

FIG. 3 - POINTS OF CONTACT FOR RIGHT & LEFT GATE CENTRALIZERS

Move the gate centralizer on the left end of the add-subtract gate shaft so the upper and lower centralizer arms on both the right and left gate centralizers are contacting at the 4 points of contact.



FI

FIG. 4 - GATE ALIGNMENT (Left End)

Turn the eccentric on the left gate arm so the accumulator dial gears at the left end of the add-subtract gate are centered between the add-subtract gears.

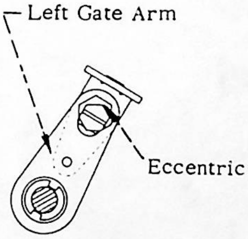


FIG. 4

Check the cycle lock pin to see that it is centered on the edge of the cycle lock disc as shown in Fig. 1.

ADJ. 2 - ADD-SUBTRACT GEAR MESH

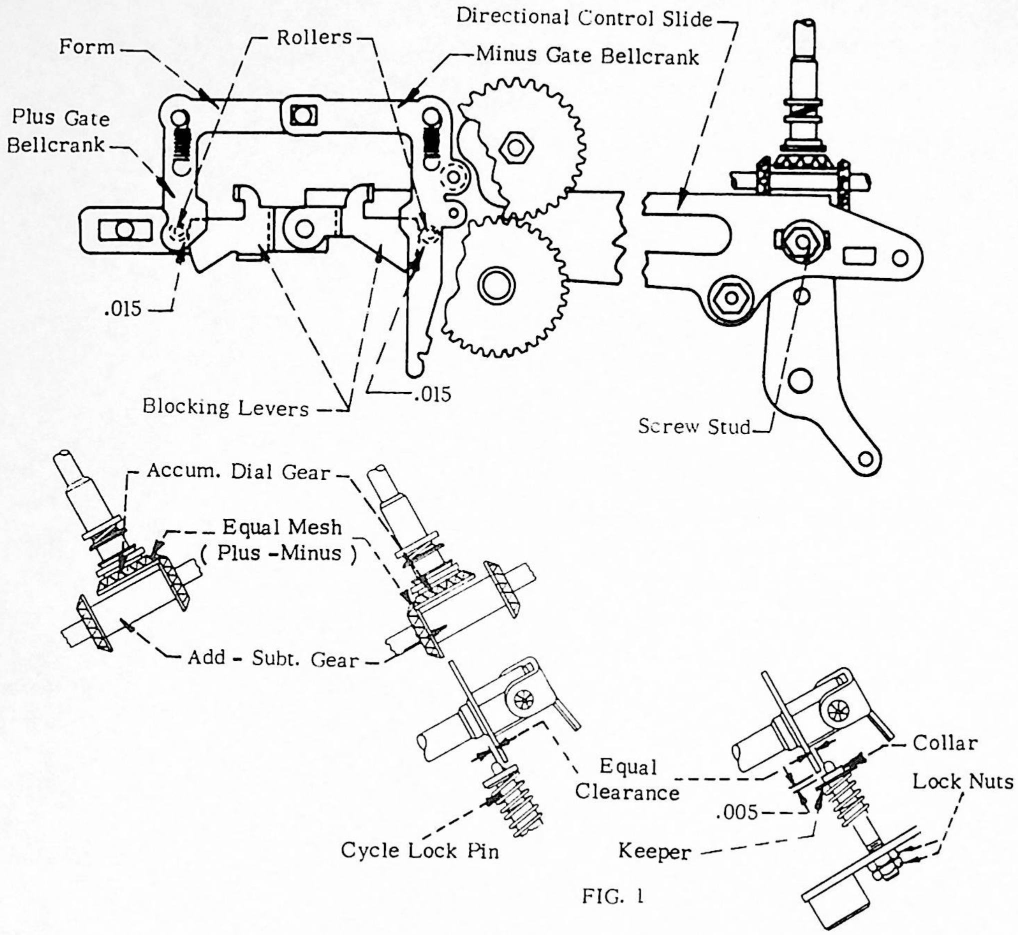


FIG. 1

FIG. 1 DIRECTIONAL CONTROL SLIDE & CYCLE LOCK PIN

With the add-subtract gate positioned in either plus or minus: the add-subtract gears are to have equal mesh with the accumulator dial gears; the cycle lock pin is to have equal clearance to the rear of the cycle lock disc in plus and to the front of the disc in minus; and the collar on the cycle lock pin is to clear the disc by .005".

To adjust:

1. Have the machine in home position and depress both blocking levers in-line with their rollers. Then adjust the directional control slide for equal movement of approximately .015" between each blocking lever and its roller. If necessary, form the plus gate bellcrank to equalize the .030" total movement.

Note: After adjusting, cycle in plus and minus and check to see that when the roller on the minus gate bellcrank is on the high point of the gate setting cam, the cycle lock pin is free to move in and out from the front or rear of the cycle lock disc.

2. With the machine in a plus or minus cycle, the collar on the cycle lock pin is to clear the cycle lock disc by .005". To adjust, turn the lock-nuts on the end of the cycle lock pin.

ADJ. 2 - ADD-SUBTRACT GEAR MESH (Cont.)

FIG. 2 - GATE STOP

With the machine cycled under power with the plus key held depressed (keyboard repeat key in forward position), the gate bumper arm is to have .000" to .005" clearance to the bumper. To adjust, form the bumper bracket.

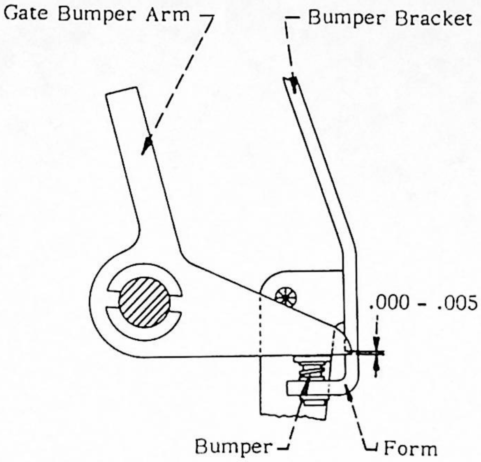


FIG. 2

FIG. 3 - MINUS GATE BELLCRANK LATCH

With the keyboard repeat key to the front, cycle the machine under power with the plus key held depressed and then with the minus key held depressed. In either operation there is to be minimum gate flicker. To adjust, turn the eccentric on the minus gate bellcrank latch until the overlatch between the minus gate bellcrank and the minus gate bellcrank latch is minimum.

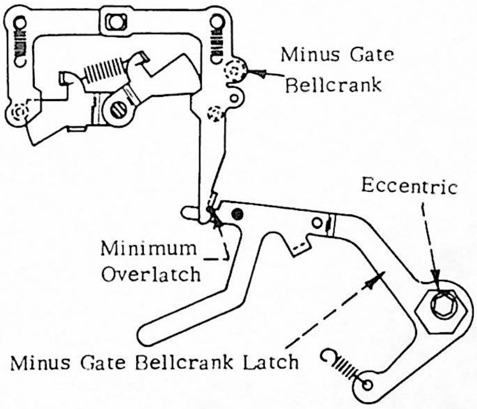


FIG. 3

ADJ. 1 - COUNTER

Figure 1 shows an overall view of the entire counter assembly for ease in orientation of the adjustment points. Reference to these adjustment points will be stated in the individual adjustment steps that follow. For positive operation of the counter it is important that the adjustment be made in sequence.

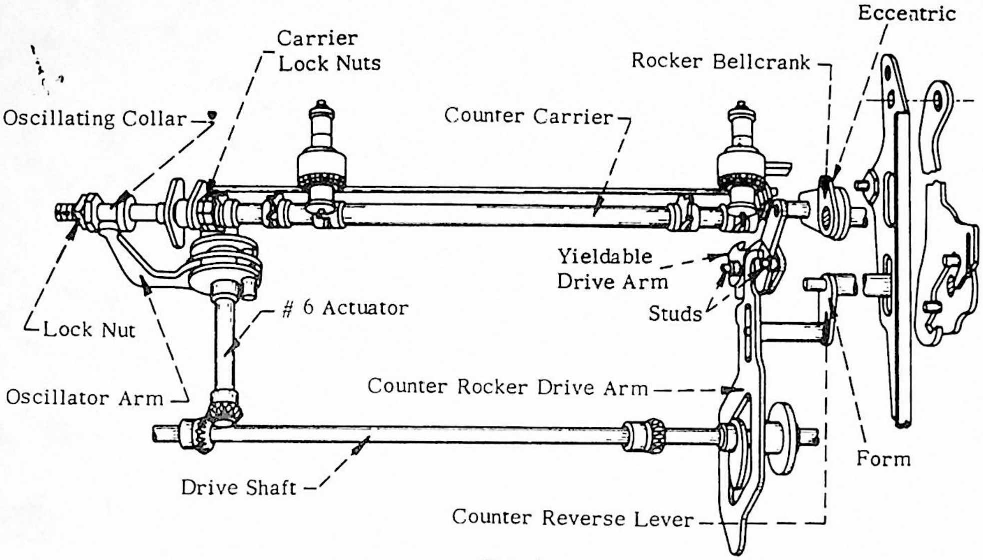


FIG. 1

FIG. 1 - COUNTER ASSEMBLY END PLAY

The individual counter finger assemblies are to be perfectly free to rotate but there must be minimum end play between the assemblies. To adjust, turn the carrier lock nuts.

NOTES

ADJ. 1 - COUNTER (Cont.)

FIG. 2 - COUNTER REVERSE YOKE

With the machine in home position and the counter reverse yoke moved up and down, the upper and lower cam slots are to engage their respective reverse cam studs without touching the edges of the slots. To adjust, turn the eccentric on the centralizer to equalize the studs with the slots. Then move the counter reverse yoke forward or rearward as required to obtain free up and down movement of the slots over the studs.

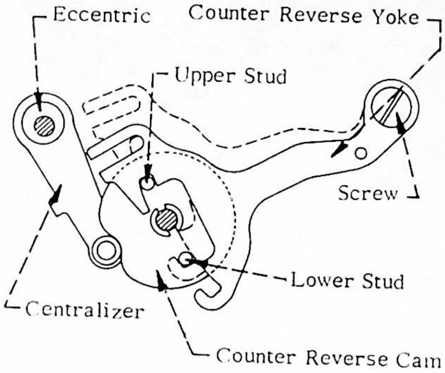


FIG. 3 - COUNTER ROCKER DRIVE ARM

With the machine cycled in plus and minus, the counter rocker drive arm is to engage its respective upper or lower stud with equal engagement. To adjust, form the counter reverse lever at point shown in Fig. 1.

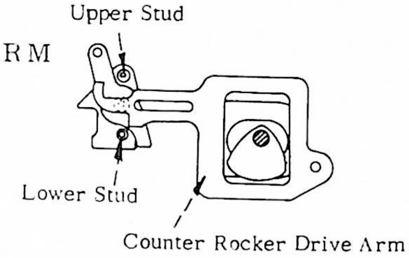
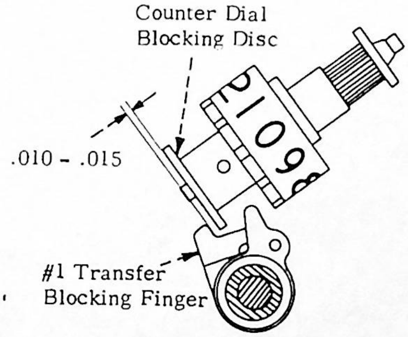


FIG. 4 - #1 TRANSFER BLOCKING FINGER

With the machine in home position and the carriage all the way to the left, the #1 transfer blocking finger is to have .010" to .015" clearance to the counter dial blocking disc. To adjust, rotate the counter carrier forward or rearward by turning the eccentric on the rocker bellcrank as shown in Fig. 1.



ADJ. 1 - COUNTER (Cont.)

FIG. 5 - COUNTING FINGER ENGAGEMENT

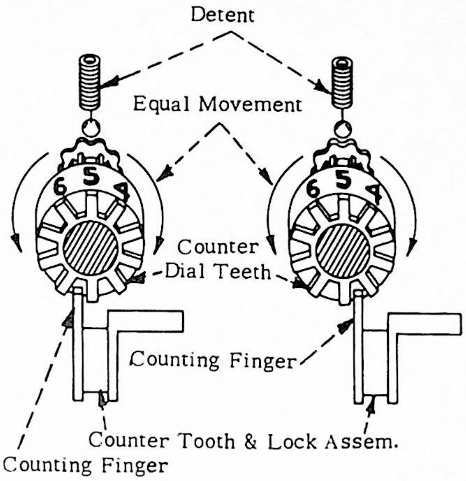
1. Check to see that the counting finger is straight. (The counting finger is the rear finger on the #1 counter finger assembly at the extreme right end of the counter carrier.)

2. Shift the carriage one or more spaces out of home position.

3. Rotate a "5" in the counter dial over the counting finger.

4. Depress the plus key and cycle the drive shaft until the counting finger moves forward and fully engages the counter dial gear with the "5". (Note: At this point the counter is to have no lateral movement.)

5. Check for equal clearance between the counting finger and the dial tooth by rotating the dial from side to side. Repeat the same procedure for the "minus" key operation.



To adjust, loosen the lock nut and move the counter carrier right or left by turning the oscillating collar as shown in Fig. 1. Then tighten the lock nut and check for proper engagement.

ADJ. 1 - COUNTER (Cont.)

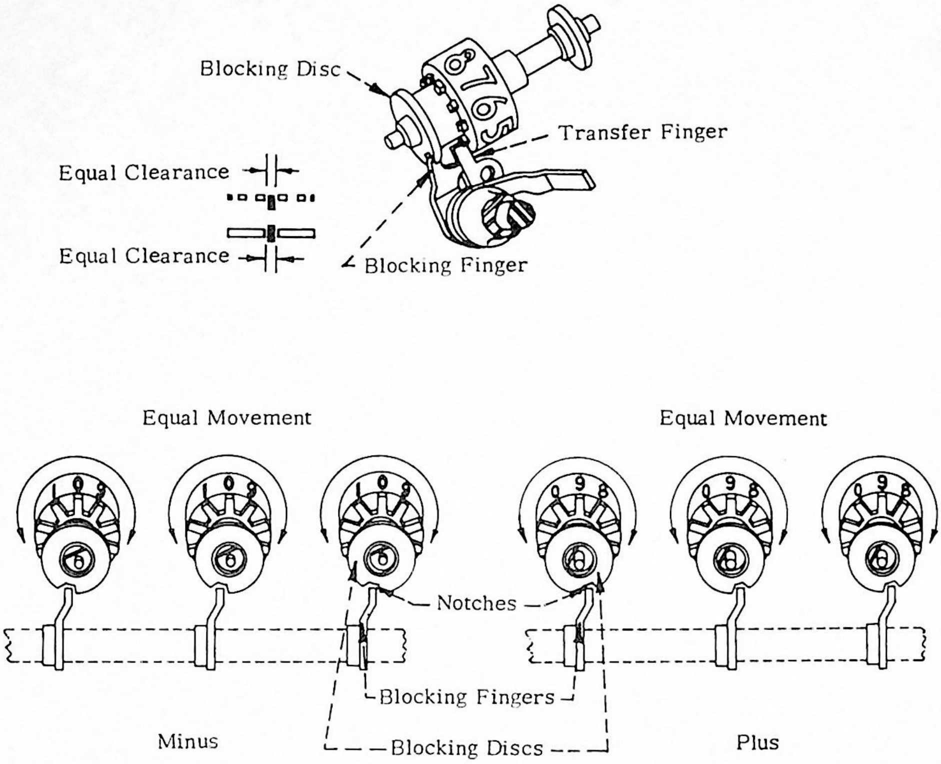


FIG. 6 - TRANSFER FINGERS & BLOCKING FINGERS

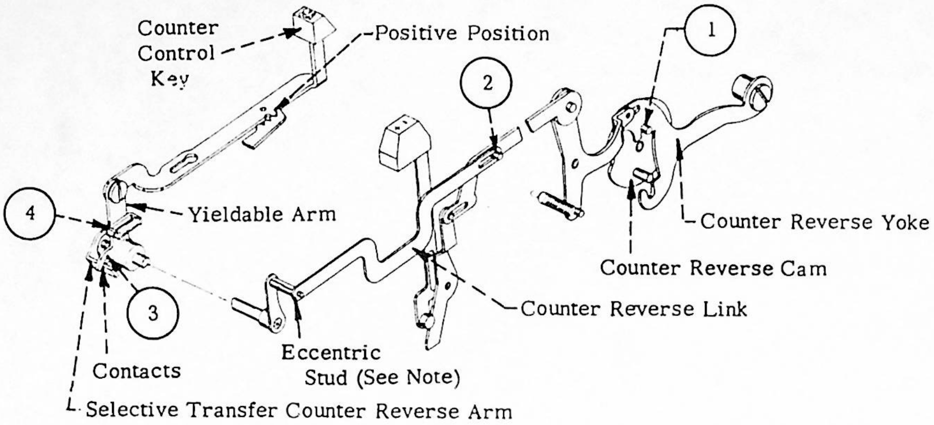
With the carriage in home position and all counter dials at "0", cycle the machine in "minus". The transfer fingers and blocking fingers are to move into engagement with their respective counter dial gear teeth and blocking disc transfer notches with equal clearance between the fingers and the gear teeth or blocking disc notches. Check by rocking the dials.

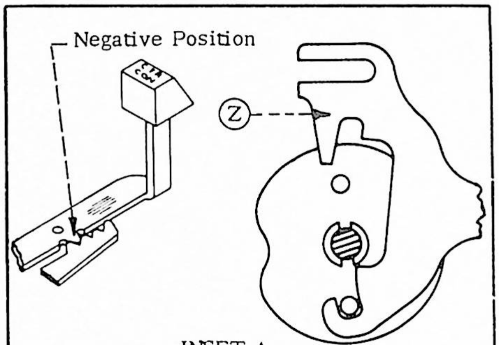
Next, rotate the counter dials to all 9's and cycle the machine in "plus". Then again check for equal clearance between the fingers and the dial gear teeth by rocking the dials.

To adjust, form the individual transfer and blocking fingers right or left as required.

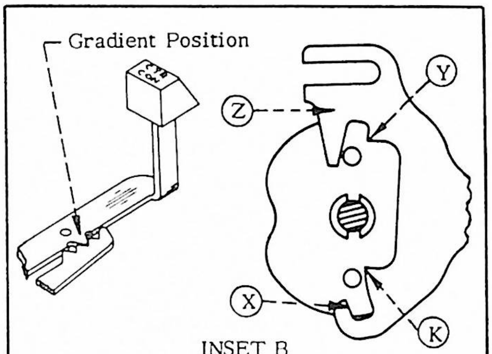
NOTE: The counting finger is already adjusted by means of the oscillating collar as explained in Fig. 5. Do not form the counting finger for this adjustment.

ADJ. 2 - COUNTER CONTROL KEY





INSET A



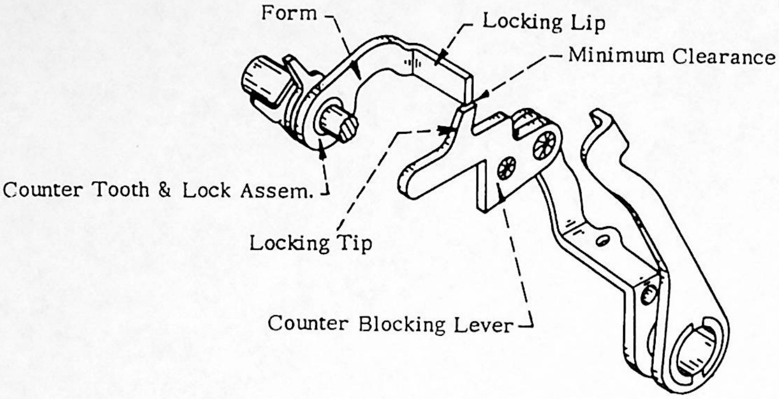
INSET B

With the counter control key moved to the rear (for normal or positive count) position, the upper slot on the counter reverse yoke is to rest on the upper stud of the counter reverse cam (point 1) with no restrictions in the linkage and just contacting at the other three points as indicated. To adjust, rotate the eccentric stud so its high point is straight up. Then rotate the selective transfer counter reverse arm on the shaft so the lip contacts the extension on the yieldable arm. After adjusting as above, check the reverse and gradient positions as follows:

1. When the counter control key is all the way forward (negative position) the lower slot in the counter reverse yoke is to fully engage the lower stud on the counter reverse cam and the hook Z is to clear the upper stud (Inset A).
2. When the counter control key is in the center (gradient) position (Inset B), and the add subtract gate is actuated rearward, hook Z is to catch the upper stud and move it rearward. The lower stud is to clear point X. When the add-subtract gate is actuated forward, the lower stud will contact point K and the upper stud is to clear point Y.

Note: On SVE model calculators only, adjust the eccentric stud on the counter reverse shaft for the same conditions as explained for Inset A. On SVJ models, the eccentric stud is neutralized by turning it to its neutral or high side up position.

ADJ. 3 - COUNTER BLOCKING LEVER



The locking tip on the counter blocking lever is to have minmum clearance to the underside of the locking lip on the #1 counter tooth and lock assembly. To adjust, form the counter tooth and lock assembly at point shown.

NOTES

ADJ. 1 - RELATCHING THE SETTING LEVERS

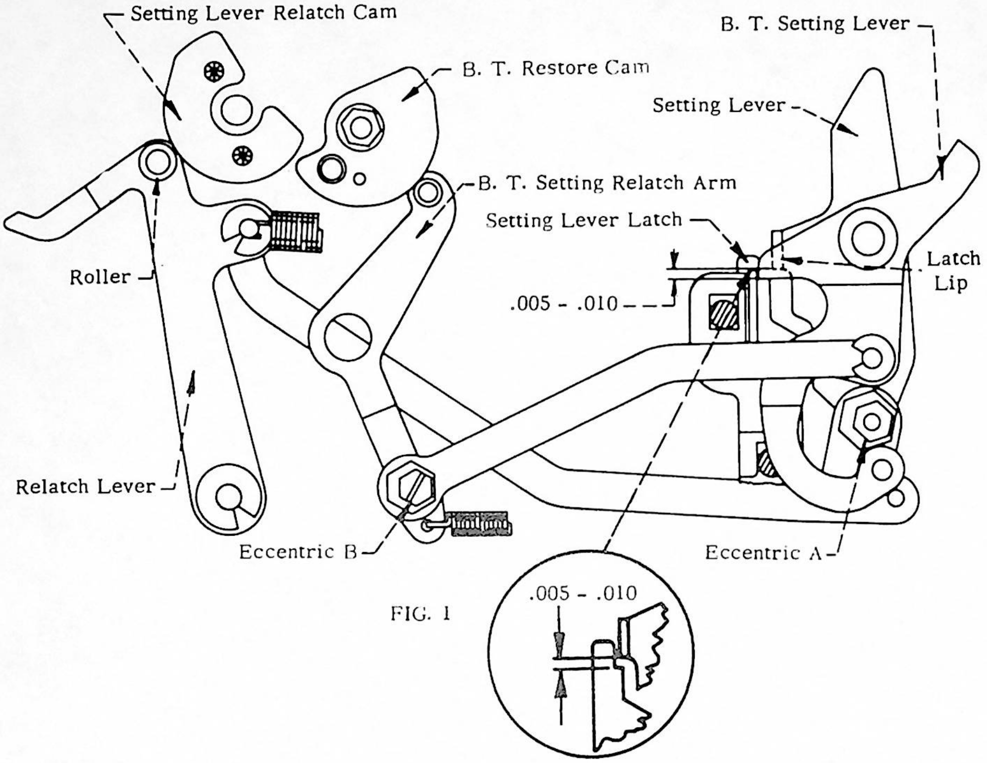


FIG. 1 - SETTING LEVER RELATCH (Machines with B. T.)

With the drive shaft cycled so the roller on the relatch lever is positioned on the setting lever relatch cam as shown, the latch lip on the setting lever is to overlatch the setting lever latch by .005" to .010" as shown in the Inset. To adjust, turn the eccentric A.

After adjusting the overlatch, pull the setting lever latch forward and then release it. The back transfer setting lever latch is to contact the end of the back transfer setting lever and prevent the setting lever from relatching as shown in Fig. 1.

Note: In some cases it may be necessary to make the adjustment shown in fig. 2 before the back transfer setting lever latch will hold the enter dividend setting lever latch from relatching.

Continued on Next Page

ADJ. 1 - RELATCHING THE SETTING LEVERS (Cont)

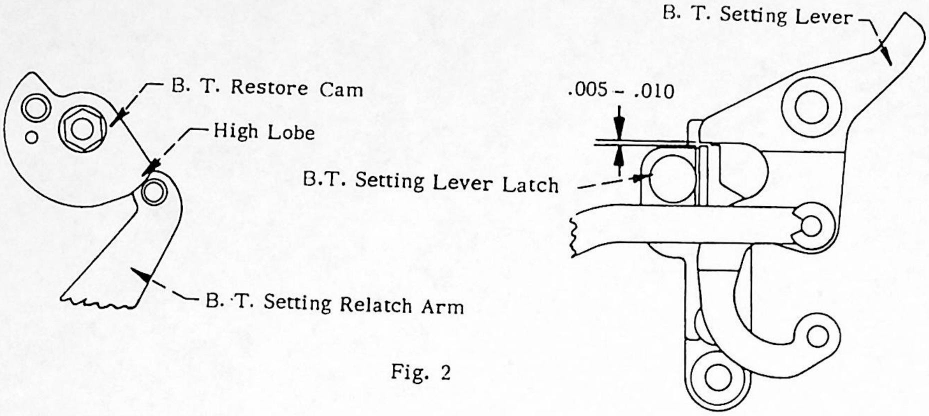


Fig. 2

FIG. 2 - BACK TRANSFER SETTING LEVER

With the drive shaft cycled so the roller on the back transfer setting relatch arm is positioned on the high lobe of the back transfer restore cam, the back transfer setting lever is to overlatch the back transfer setting lever latch by .005" to .010". To adjust, turn eccentric B as shown in Fig. 1.

FIG. 3 - SETTING LEVER RELATCH (Machines without B. T.)

On machines without back transfer, cycle the drive shaft until the roller on the relatch lever is on the high lobe of the setting lever relatch cam. At this point, the latch lip on the setting lever is to overlatch the interlock latch by .005" to .010". To adjust, turn the eccentric A. After adjusting the overlatch, cycle the drive shaft until the setting lever relatch cam is positioned as shown in Fig. 1. Then pull the setting lever latch forward and release it. The interlock latch is to contact the setting lever latch and prevent the setting lever from relatching as shown in the Inset.

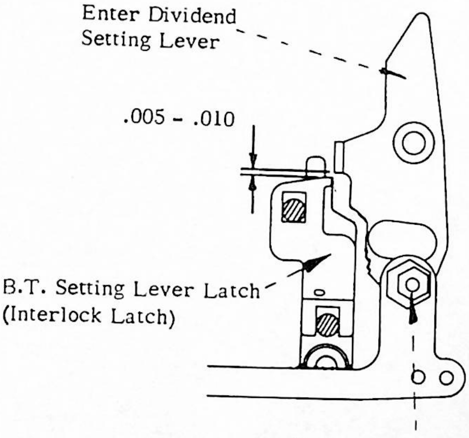
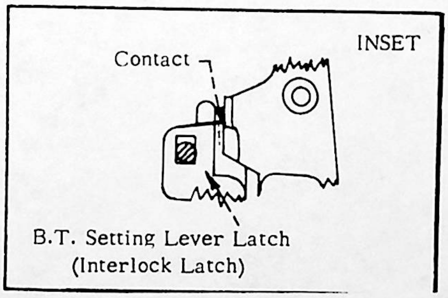
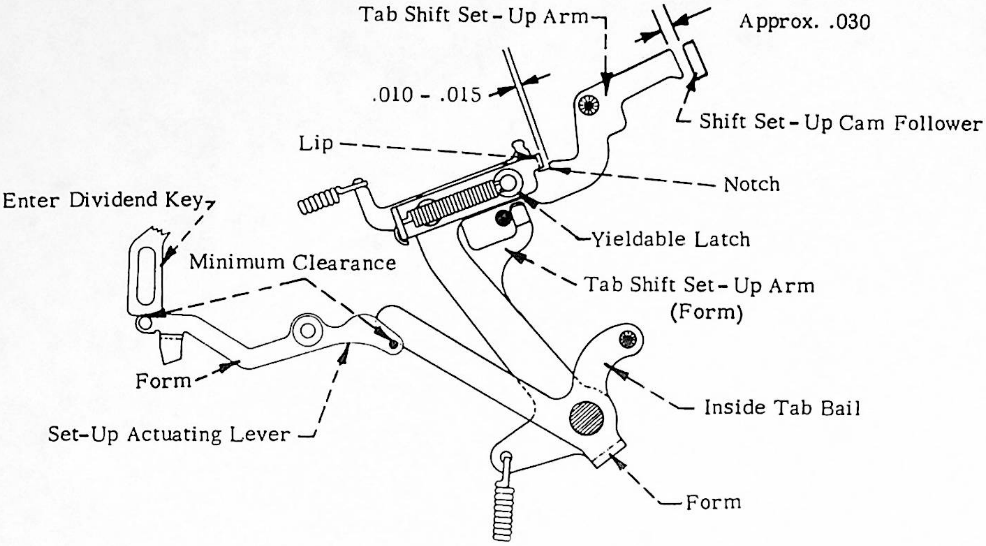


Fig. 3



ADJ. 2 - SET-UP ACTUATING LEVER AND INSIDE TAB BAIL



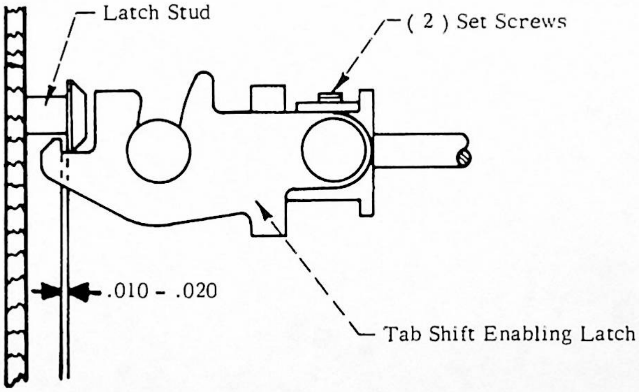
With the machine in home position and no operating keys depressed there is to be:

1. Approximately .030" clearance between the tab shift set-up arm and the tab shift set-up cam follower. To adjust, form the tail on the tab shift set-up arm.

2. Minimum clearance between the two points indicated at the studs on the set-up actuating lever. To adjust, form the set-up actuating lever.

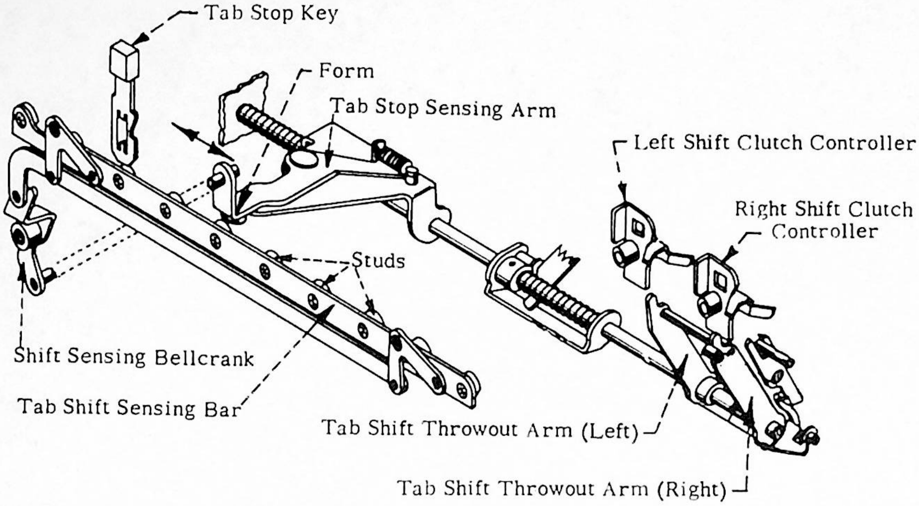
3. Approximately .010" to .015" clearance between, the lip on the yieldable latch and the notch on the tab shift set-up arm. To adjust, form the inside tab bail at point indicated.

ADJ. 3 - TAB SHIFT ENABLING LATCH



With the drive shaft in home position, the latch lip on the tab shift enabling latch is to overlatch the latch stud by .010" to .020". To adjust, loosen the two set-screws and move the latch right or left as required.

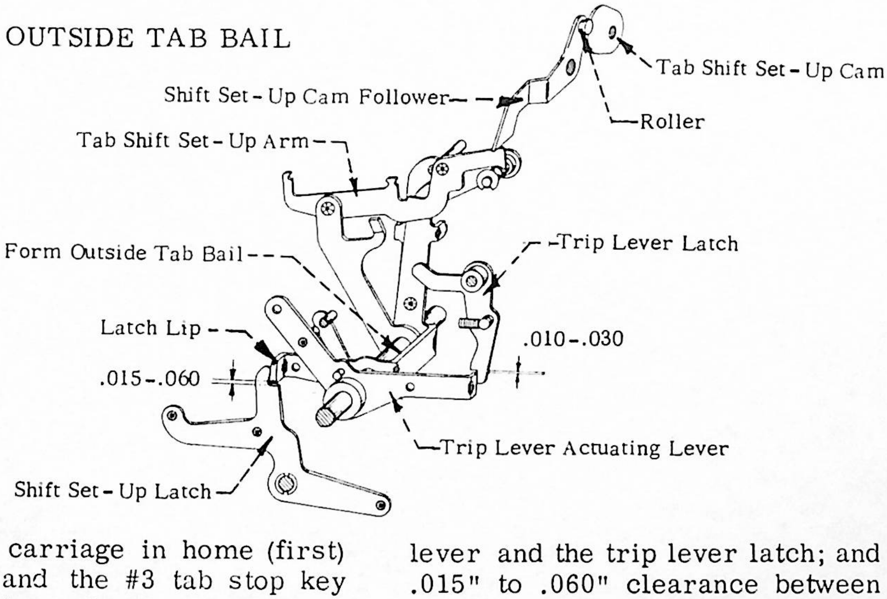
ADJ. 4 - TAB SHIFT THROWOUT ARMS


Tab Stop Key
Form
Tab Stop Sensing Arm
Left Shift Clutch Controller
Right Shift Clutch Controller
Studs
Shift Sensing Bellcrank
Tab Shift Sensing Bar
Tab Shift Throwout Arm (Left)
Tab Shift Throwout Arm (Right)

1. With a tab stop key depressed over the tab shift sensing bar, cycle the machine in enter dividend until the tab shift throwout arms are actuated. At this point: The right tab shift throwout arm is to engage the right shift clutch controller and the left tab shift throwout arm is to clear the left shift clutch controller.
2. With no tab stop key depressed, the left tab shift throwout arm is to engage the left shift clutch controller and the right tab shift throwout arm is to clear the right shift clutch controller.

To adjust, form the tab stop sensing arm at point indicated.

ADJ. 5 - OUTSIDE TAB BAIL



With the carriage in home (first) position and the #3 tab stop key depressed, cycle the machine in enter dividend until the roller on the shift set-up cam follower is on the high point of the tab shift set-up cam. At this point: there is to be .010" to .030" clearance between the trip lever actuating lever and the trip lever latch; and .015" to .060" clearance between the latch lip on the outside tab bail and the shift set-up latch. To adjust, form the outside tab bail.

Note: Check to see that the taper pin on the tab shift set-up cam is flush with the hub.

ADJ. 6 - MINUS GATE BELLCRANK LATCH

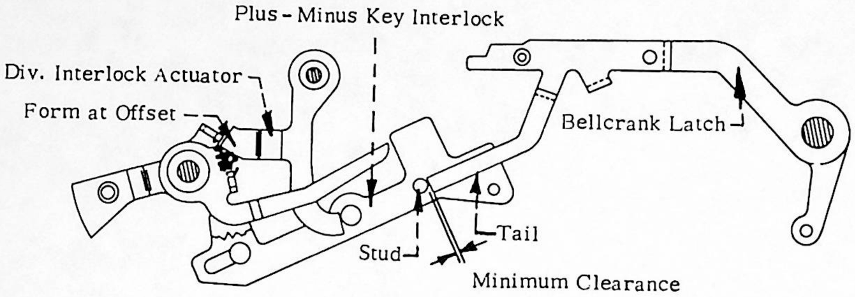


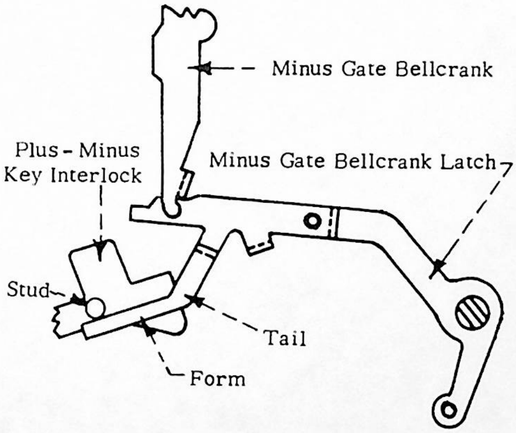
FIG. 1 - BLOCKOUT FOR BACK TRANSFER

With the division keys depressed, cycle the drive shaft one quarter turn. At this point, there is to be minimum clearance between the tail on the bellcrank latch and the stud on the plus-minus key interlock. To adjust, form the division interlock actuator at the offset. Then check to see that the product-to-keyboard key is interlocked.

Note: When the division keys are depressed and released, the tail on the bellcrank latch is to move behind the stud on the plus-minus key interlock immediately.

FIG. 2 - DISENGAGEMENT FOR ENTER DIVIDEND

With the enter dividend key depressed, the stud on the plus-minus key interlock is to move over the tail on the minus gate bellcrank latch and prevent the minus gate bellcrank from latching. To adjust, form the tail on the minus gate bellcrank latch.



ENTER DIVIDEND

ADJ. 7- SETTING LEVER DELATCHING

FIG. 1 - SETTING LEVER LATCH

Vith one of the tab stop keys deressed, cycle the machine in nter dividend until the setting ever is delatched. At this point, here is to be approximately .020" o .050" clearance between the etting lever latch lip and the etting lever latch. To adjust, form he delatching lever at point shown. ote: When delatching the setting ever, check to see that nothing nterferes with its free movement o its maximum travel.

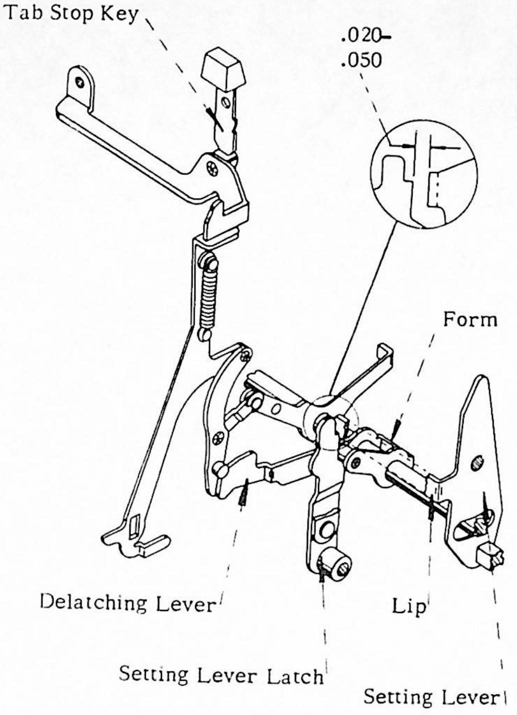


Fig. 1

FIG. 2 - SHIFT SET-UP LATCH

Vith the setting lever delatched nd the tab stop key depressed latched position), the shift set-up atch is to have .020" to .060" learance to the lip on the outside ab bail. To adjust, form the shift et-up latch at point K.

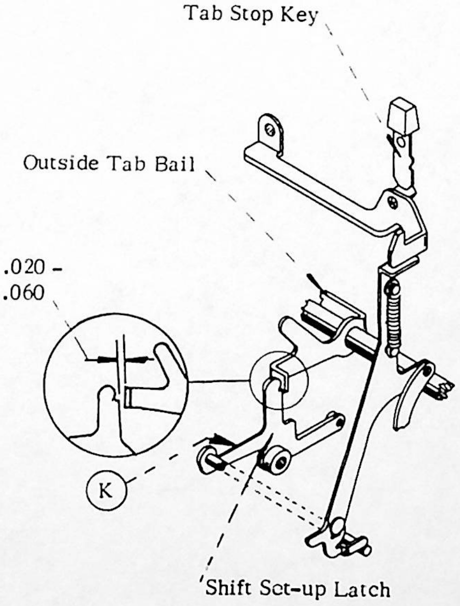


Fig. 2

ADJ. 7- SETTING LEVER DELATCHING (Cont)

FIG. 3 - TRIP LEVER LATCH

With the setting lever delatched, depress the end of the tab disabling lever until the trip lever latch has approximately .010" to .030" clearance to the lip on the trip lever actuating lever. At this point, move the bumper A against the end of the tab disabling lever.

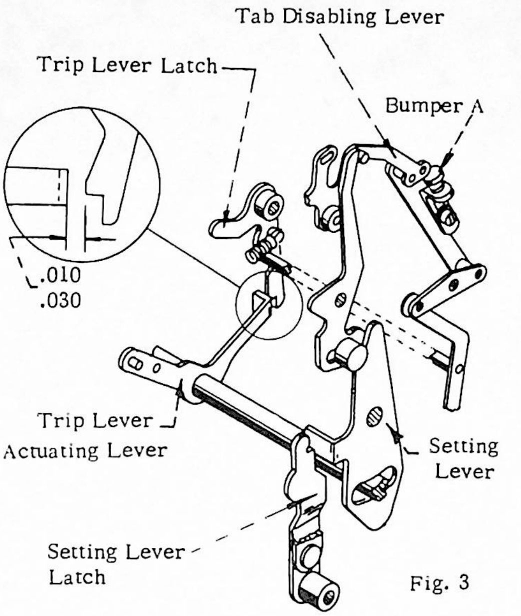


Fig. 3

FIG. 4 - PLUS BLOCKING LEVER & MICRO SWITCH BOOSTER

1. With the setting lever delatched, the tail on the relatch lever is to be positioned under the stud on the plus blocking lever as shown in the Inset. To adjust, move stud B against the setting lever.
2. Also, the micro switch booster is to close the micro switch and have approximately .020" movement remaining before bottoming. To adjust, move the booster actuator.
3. With the machine cycled in minus, there is to be no more than .030" bounce of the plus blocking lever. To adjust, first recheck the overlatch of the setting lever as explained in Adj. 1, Fig. 1 this section. Then if necessary, form the front tail on the relatch lever as required. After adjusting, delatch the setting lever and check to see that the plus blocking lever has a good bite on the plus gate bellcrank stud.

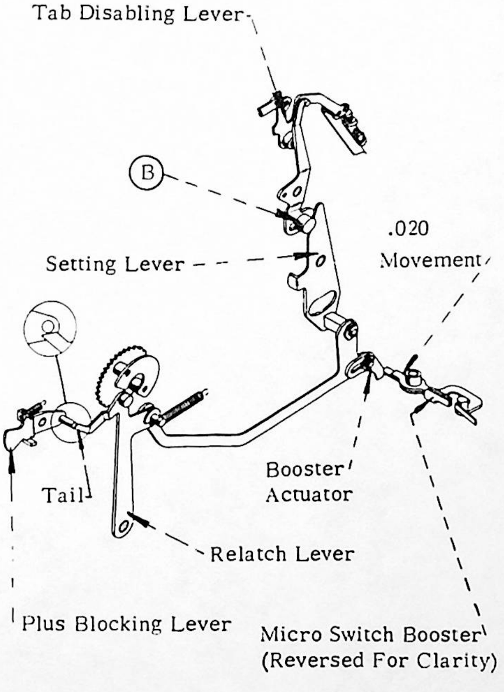
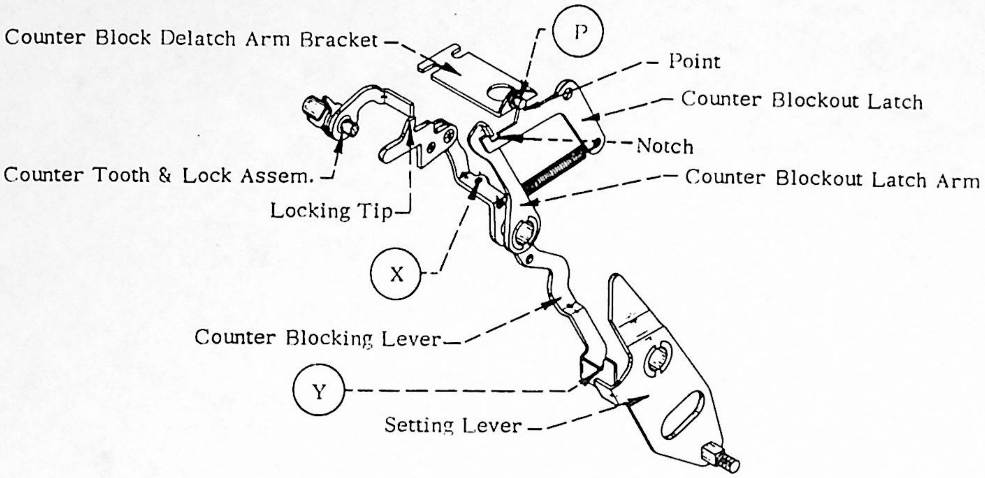
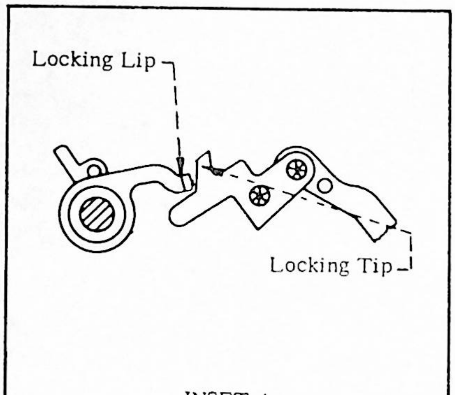


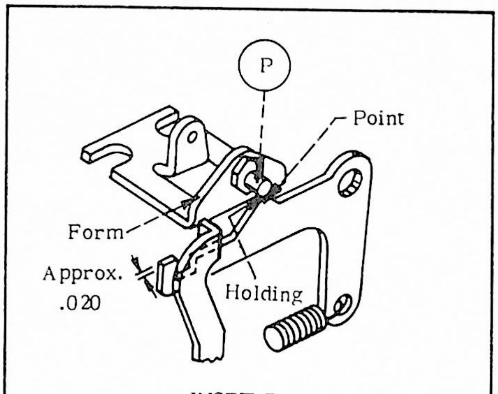
Fig. 4

ADJ. 8 - COUNTER BLOCKOUT


Counter Block Delatch Arm Bracket
P
Point
Counter Blockout Latch
Notch
Counter Blockout Latch Arm
Counter Tooth & Lock Assem.
Locking Tip
X
Counter Blocking Lever
Y
Setting Lever



INSET A



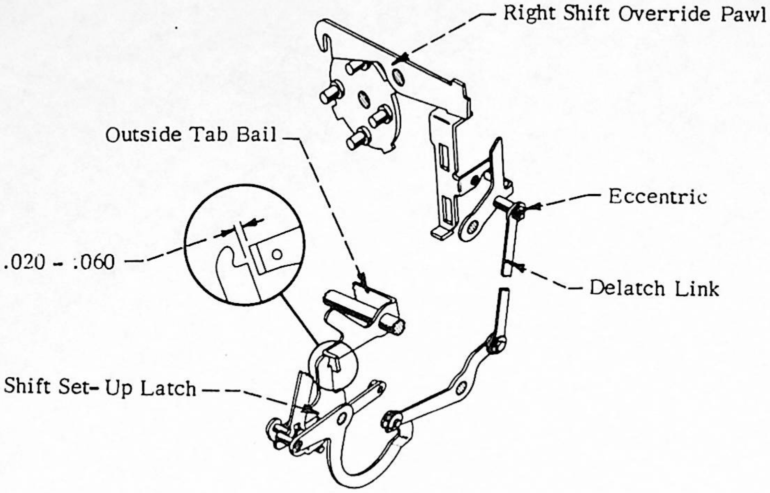
INSET B

1. With the machine in home position and the carriage open, delatch the setting lever and rotate the drive shaft until the add-subtract gate is positioned to the rear (plus), and the setting lever relatch cam contacts the roller on the relatch lever. At this point: stud P is to be off the point of the counter blockout latch, and the notch on the counter blockout latch is to be engaged on the counter blockout latch arm with a good overlatch. To adjust, form the counter blocking lever at point Y.

2. With the setting lever relatched (by rotating the drive shaft a half-cycle), there is to be good engagement between the locking tip on the counter blocking lever and the locking lip on the counter tooth and lock assembly. To adjust, form the counter blocking lever at point X. Then with the machine restored to home position, manually rotate the counter locking lip to see that it clears the locking tip on the counter blocking lever as shown in Inset A.

3. With the add-subtract gate in home position and stud P contacting the point on the counter blockout latch, the latch lip on the counter blockout latch arm is to have approximately .020" clearance to the top edge of the counter blockout latch as shown in Inset B. To adjust, raise or lower stud P by forming at point shown.

ADJ. 9 TAB SHIFT DELATCHING ON OVERRIDE

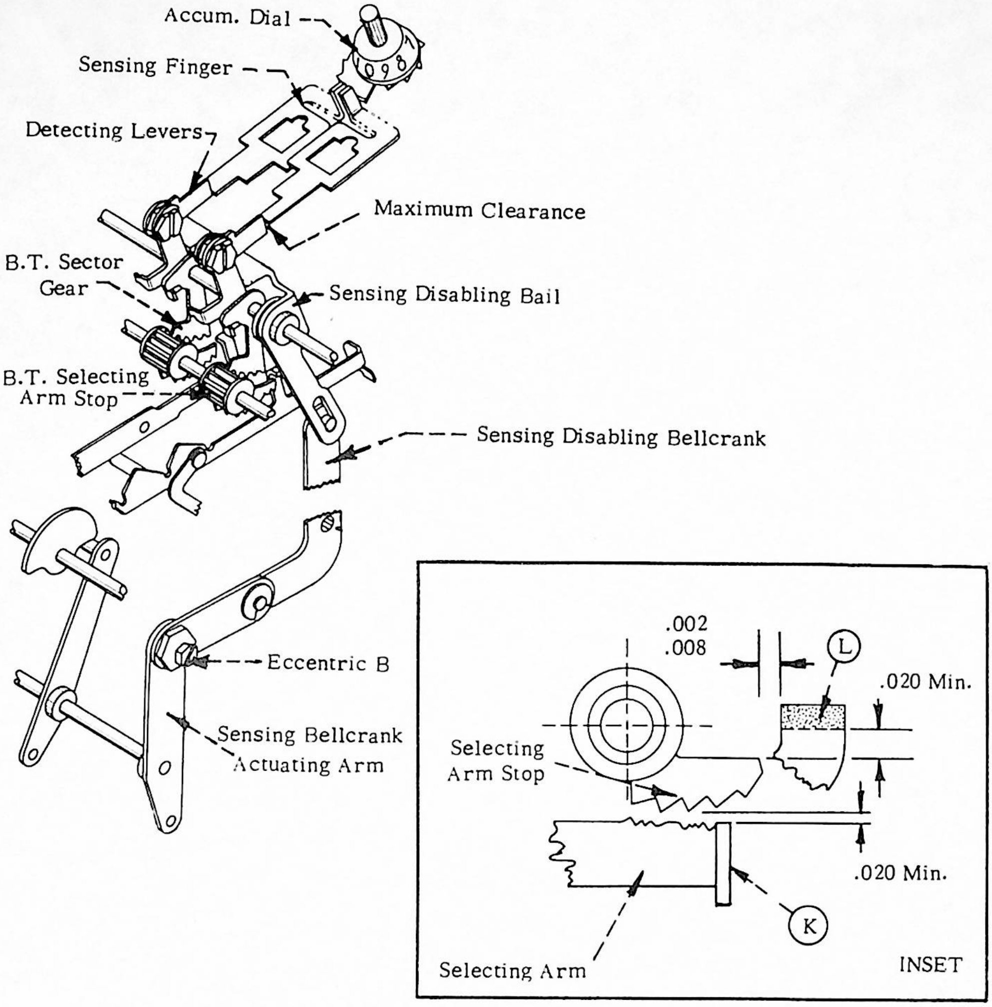


With the right override pawl on the high point of movement with the carriage shift gear, there is to be .020" to .060" clearance between the shift set-up latch and the latch lip on the outside tab bail. To adjust, turn the eccentric on the delatch link. After adjusting as above, check Adj. 3, page 3-5 to see that the shift set-up latch is delatched by the override action as described above.

NOTES

ADJ. 1 - BACK TRANSFER PROGRAM UNIT

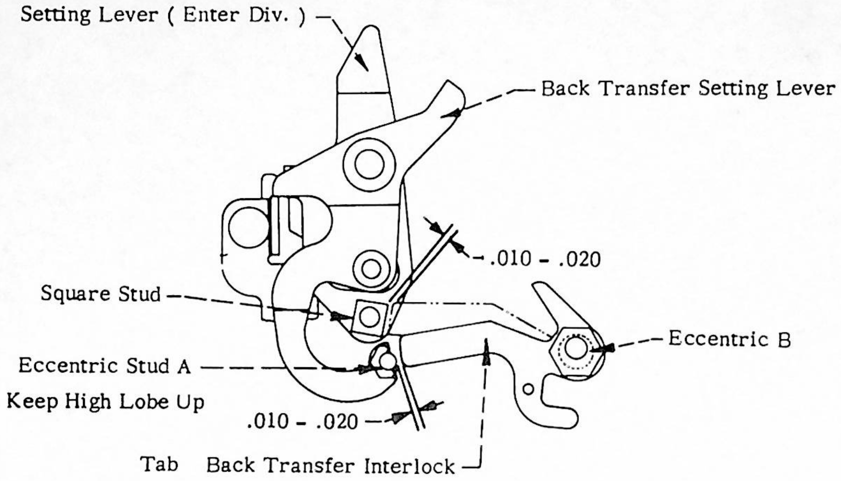
Not a Issued



1. With the unit installed (keyboard out) manually rotate the back transfer selecting arm stops to the zero position and check for .002" to .008" clearance between the end of the stops and the selecting arm stop lips. To adjust, either rotate the back transfer program unit by tilting the front support bar, or if necessary to correct an individual clearance, form the selecting arm stop lip.

2. With the machine in home position, the detecting levers are to have maximum clearance to the sensing fingers. To adjust, turn the eccentric B. After adjusting, check for .020" minimum clearance between the selecting arm stops and points K and L as shown in the Inset.

ADJ. 2 - TAB BACK TRANSFER INTERLOCK

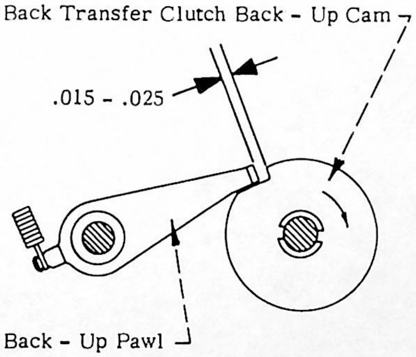

Setting Lever (Enter Div.)
Back Transfer Setting Lever
.010 - .020
Square Stud
Eccentric B
Eccentric Stud A
Keep High Lobe Up
.010 - .020
Tab Back Transfer Interlock

1. With the tab back transfer interlock in its "up" (actuated) position, there is to be .010" to .020" clearance between the end of the tab back transfer interlock and the square stud. To adjust, rotate the eccentric B.
2. With the tab back transfer interlock in its "down" (restored) position, there is to be .010" to .020" clearance between the end of the tab back transfer interlock and the eccentric stud A. To adjust, rotate the eccentric stud A.

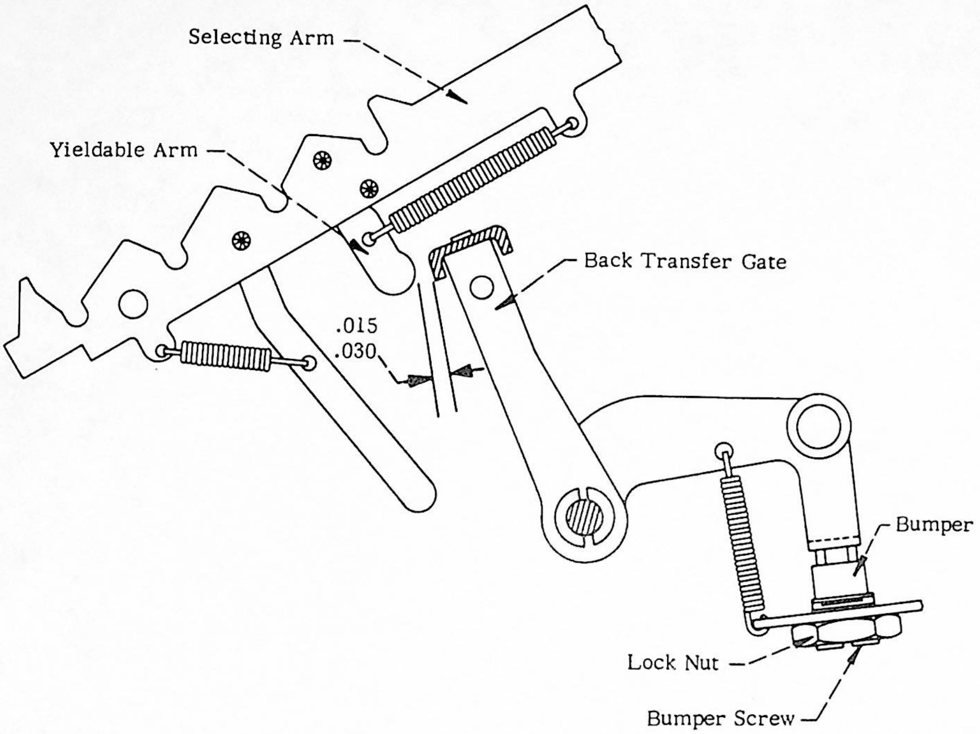
ADJ. 3 - BACK TRANSFER CLUTCH BACK-UP·PAWL

With the machine in home position and the back transfer clutch back-up cam held clockwise, there is to be .015" to .025" clearance between the back-up pawl and the latching face on the back-up cam. To adjust, form the ear on the back-up pawl.

To check the adjustment, raise the back-up pawl and allow the cam to restore. The back-up pawl is not to drop into the cam notch.

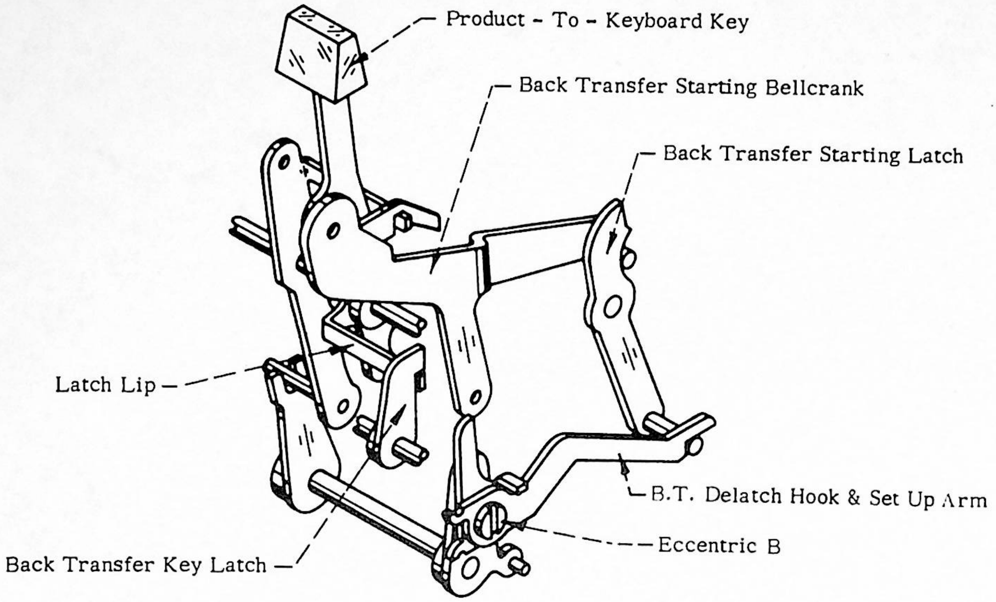


ADJ. 4 - CLEARANCE FOR BACK TRANSFER GATE



With all the selecting arms in their fully restored (home) position, there is to be .015" to .030" clearance between the back transfer gate and the yieldable arms. To adjust, turn the bumper in or out as required.

ADJ. 5 - LATCHING OF PRODUCT TO KEYBOARD KEY

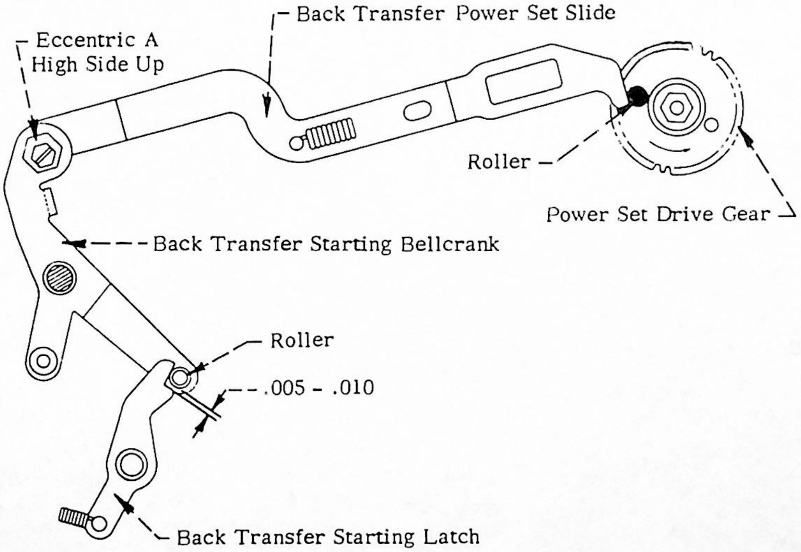

Product - To - Keyboard Key
Back Transfer Starting Bellcrank
Back Transfer Starting Latch
Latch Lip
B.T. Delatch Hook & Set Up Arm
Eccentric B
Back Transfer Key Latch

With the machine in home position, pull the product-to-keyboard key slowly forward. The key is to latch just as the back transfer starting bellcrank is delatched.

To adjust, rotate eccentric B.

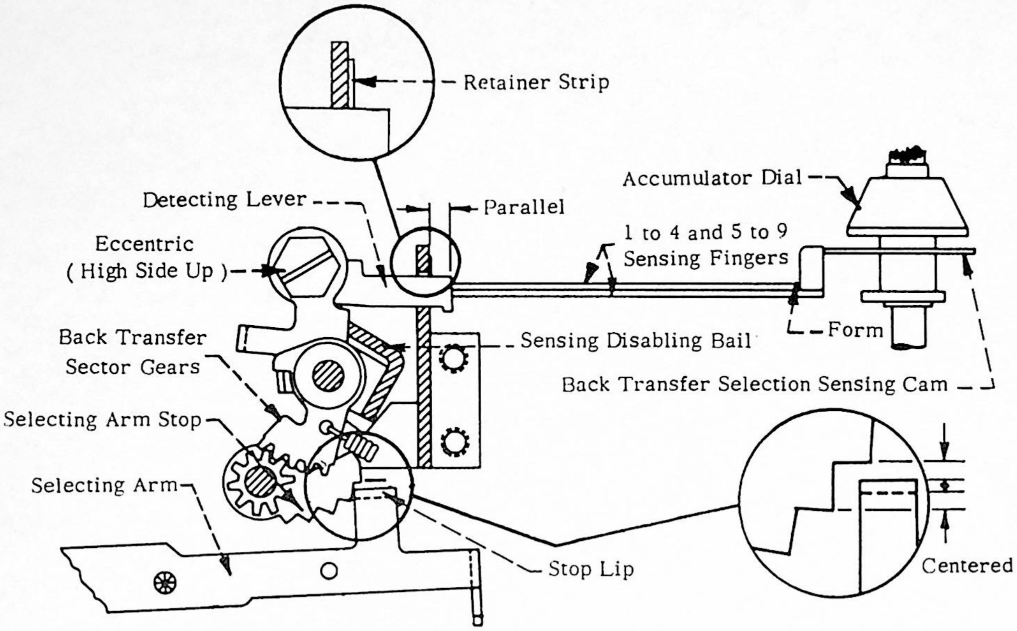
Note: The back transfer delatch hook and set-up arm must pivot freely on eccentric B.

ADJ. 6-OVERLATCH OF THE BACK TRANSFER STARTING BELLCRANK


Back Transfer Power Set Slide
Eccentric A
High Side Up
Roller
Power Set Drive Gear
Back Transfer Starting Bellcrank
Roller
.005 - .010
Back Transfer Starting Latch

When the back transfer power set slide is at its maximum movement with the roller on the power set drive gear, there is to be .005" to .010" clearance (overlatch) between the back transfer starting latch and the roller on the back transfer starting bellcrank. To adjust, turn eccentric A, but keep the high side of the eccentric up.

ADJ. 7 - ENGAGEMENT OF THE SELECTING ARM STOPS



For proper operation of back transfer, the engagement of the selecting arm stops to the stop lips on the selecting arms must be adjusted to each carriage tab stop position and to each number 1 through 9 in the accumulator dials as follows:

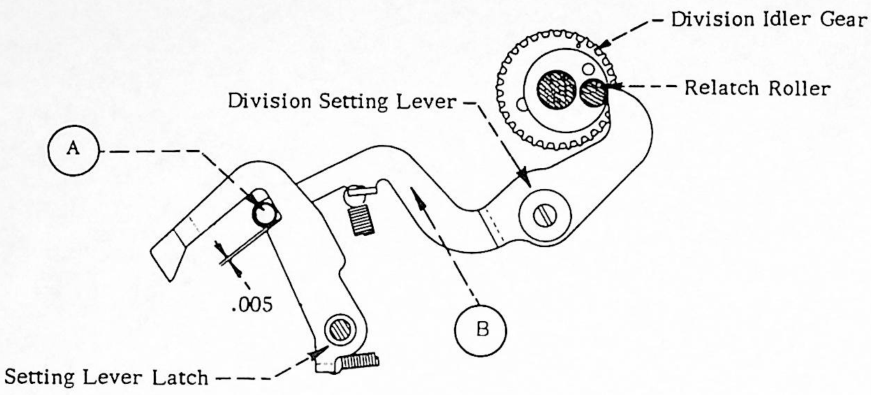
With the keyboard out of the machine and all 5's in the accumulator dials, cycle the machine in back transfer until the selecting arm stops are positioned. Then starting from the right, manually pull each selecting arm forward until the stop lip is against its selecting arm stop. At this point: (1) The stop lip is to be approximately centered on the selecting arm stop tooth as shown in the inset. To adjust, turn the eccentrics on the detecting levers; keeping the high side of the eccentrics up, and the detecting levers as near parallel to the unit frame as possible. (2) Move the retainer strip down as far as possible without binding the detecting levers.

After adjusting as above, install the keyboard and check the back transfer operation under power as follows: Starting with all 0's, back transfer from each tab stop position 0 through 10. Then use all 1's through all 9's in the keyboard; and alternately enter dividend, and back transfer from each tab stop position; checking the back transfer selection after each operation.

If a wrong selection occurs from the back transfer operation of any accumulator dial, first recheck the selecting arm stop engagement on another dial as previously explained. Then, either readjust the eccentric, or form the tip of the individual sensing finger where it contacts the back transfer selection sensing cam. After adjusting, start with all 0's and repeat the entire test. Continue to test and adjust in this manner until the back transfer selection is corrected to each number and carriage position.

Note: Also, the drive shaft speed must not exceed 500 rpm.

ADJ. 1 - RELATCHING OF DIVISION SETTING LEVER



With the division setting lever at its high point of movement with the relatch roller, the roller A is to overlatch the setting lever latch by .005". To adjust, form the division setting lever at point "B".

ADJ. 2 - CONNECTOR ARM & THROWOUT ACTUATOR

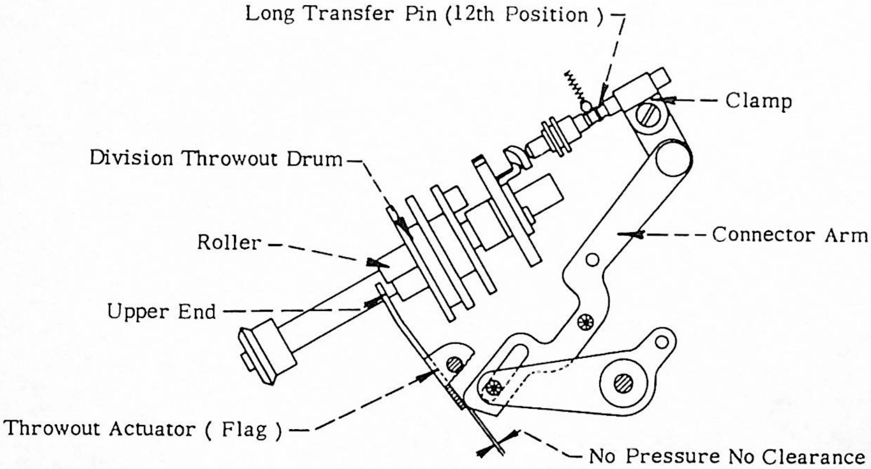


FIG. 1

FIG. 1 - CONNECTOR ARM CLEARANCE TO THROWOUT ACTUATOR

With the long transfer pin (12th position) detented to its rearward position, rotate the connector arm into position over the throwout actuator. The connector arm is to have no pressure and no clearance to the throwout actuator. To adjust, move the clamp on the long transfer pin.

ADJ. 2 - CONNECTOR ARM & THROWOUT ACTUATOR (Cont.)

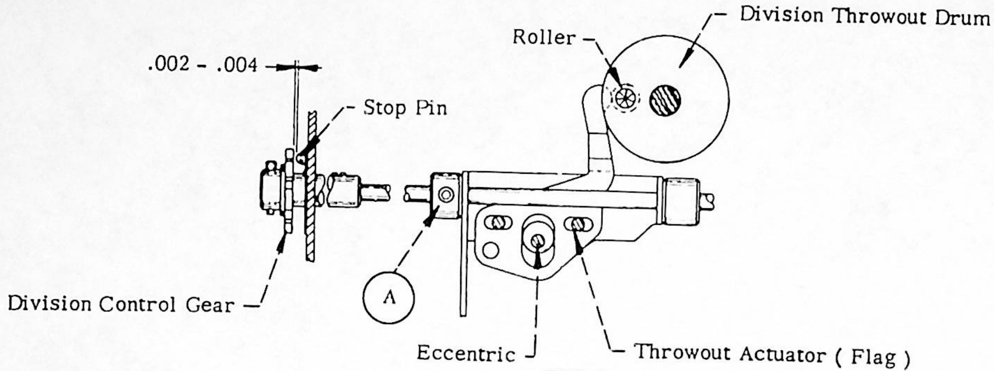
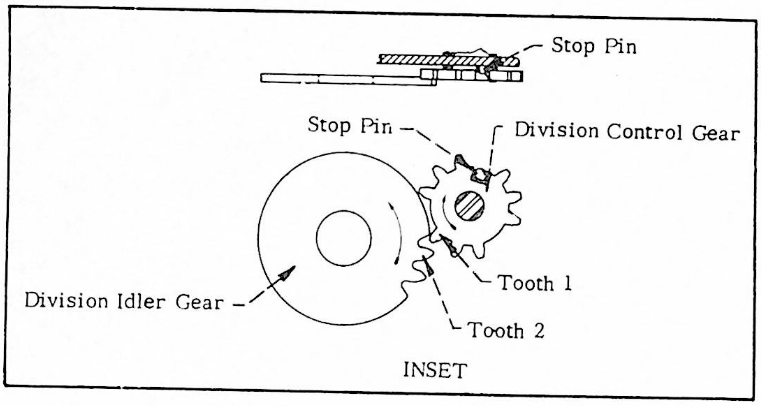


FIG. 2



INSET

FIG. 2 - DIVISION CONTROL GEAR CLEARANCE TO STOP PIN

1. The throwout actuator (flag) is to have a minimum amount of end play and yet be free to rotate. To adjust, move collar A.

2. Just as the roller on the division throwout drum picks up the throwout actuator and begins to move the division control gear out, tooth "1" on the division control gear is to be in line with tooth "2" on the division idler gear. When the roller on the division throwout drum has moved the division control gear to its maximum travel to the right, there is to be .002" to .004" clearance between the division control gear and the stop pin. To adjust, rotate the eccentric on the throwout actuator.

ADJ. 3 - DIVISION CONTROL GEAR & ADD-SUBT. GATE

FIG. 1 - FREE MOVEMENT OF DIVISION THROWOUT SHAFT

1. With the machine cycled in division until the roller on the division throwout drum is at its high point of movement with the throwout actuator, the restore spring for the throwout shaft is to be fully compressed, but not over compressed. To adjust, move the collar.

2. Continue to cycle the drive shaft in division until the add-subtract gate is moved to the minus position (division control gear in home position) and check for free in and out movement of the division throwout shaft. (The cams on the division throwout shaft are not to drag against roller 1 or roller 2 on the division control arm.) To adjust, rotate the eccentric on the division control arm.

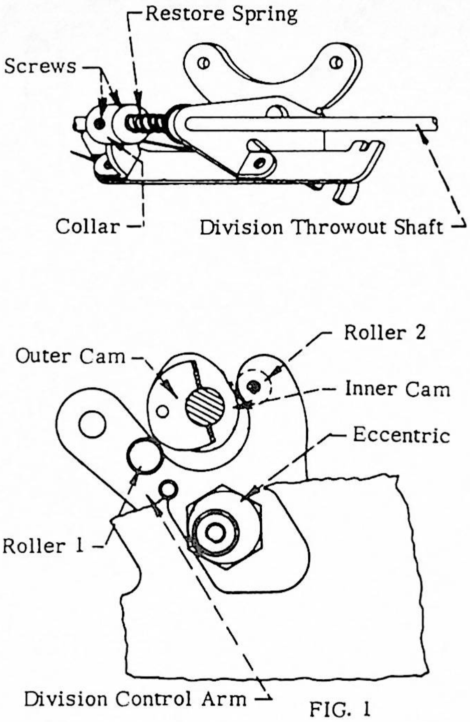


FIG. 1

NOTES

ADJ. 3 - DIVISION CONTROL GEAR & ADD-SUBT. GATE (Cont.)

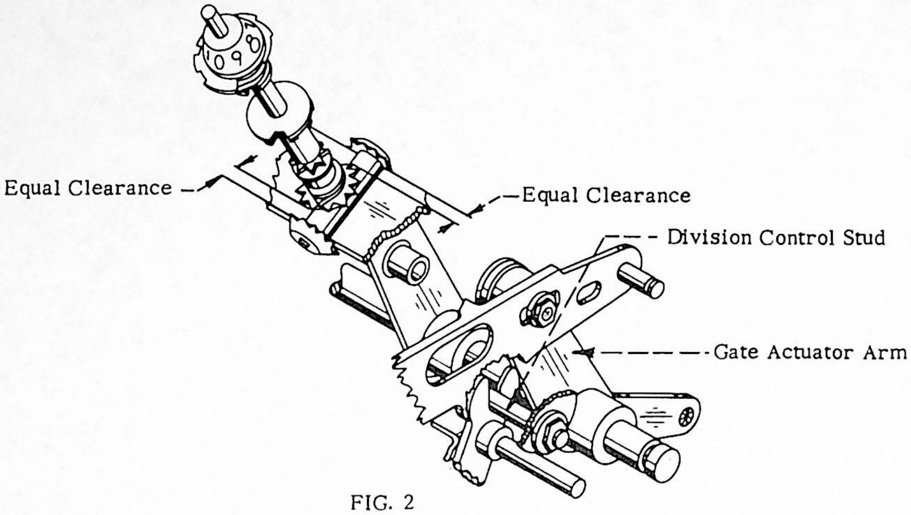


FIG. 2

FIG. 2 - CENTRALIZING THE ADD-SUBT. GATE FOR DIVISION

With the machine cycled in division until the add-subtract gate is centralized and the carriage is in a half-shift position, there is to be equal clearance between the accumulator dial gears and the front and rear add-subtract gears. To adjust, move the division control stud.

Note: Check for equal engagement of the add-subtract gears to the accumulator dial gears in the plus and minus position of the division operation. Also, for free movement of the cycle lock pin. Then as the machine shuts off in division, there is to be no movement of the add-subtract gate as the division control lever drops. If any of these conditions are found to be incorrect, it will be necessary to readjust the carriage and gate setting adjustments before readjusting for the neutral clearance as stated above.

ADJ. 4 - CARRIAGE SHIFT

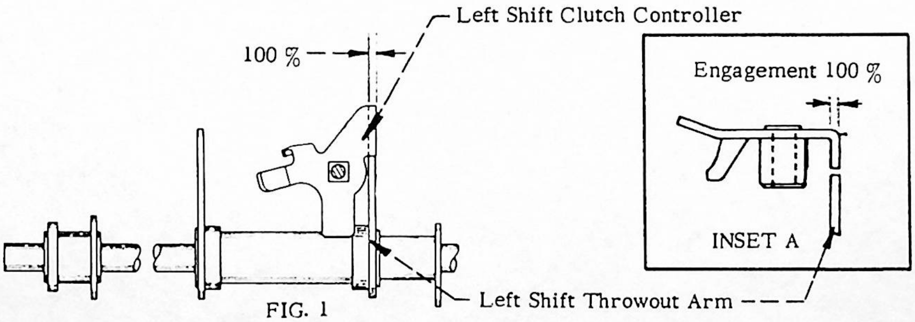


FIG. 1

FIG. 1 - ENGAGEMENT OF LEFT SHIFT THROWOUT ARM

With the machine in home position, the left shift throwout arm is to engage the left shift clutch controller with a 100% bite as shown in Inset A. To adjust, form the left shift throwout arm.

ADJ. 4 - CARRIAGE SHIFT (Cont.)

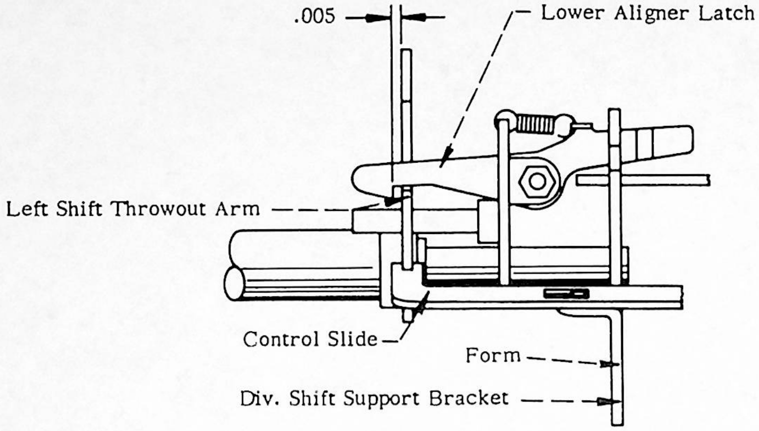


FIG. 2

FIG. 2 - HOME CLEARANCE OF LOWER ALIGNER LATCH

With the machine in home position, there is to be .005" clearance between the lower aligner latch and its latching point on the left shift throwout arm. To adjust, form the division shift support bracket at point shown.

NOTES

Continued on Next Page

ADJ. 4 - CARRIAGE SHIFT (Cont.)

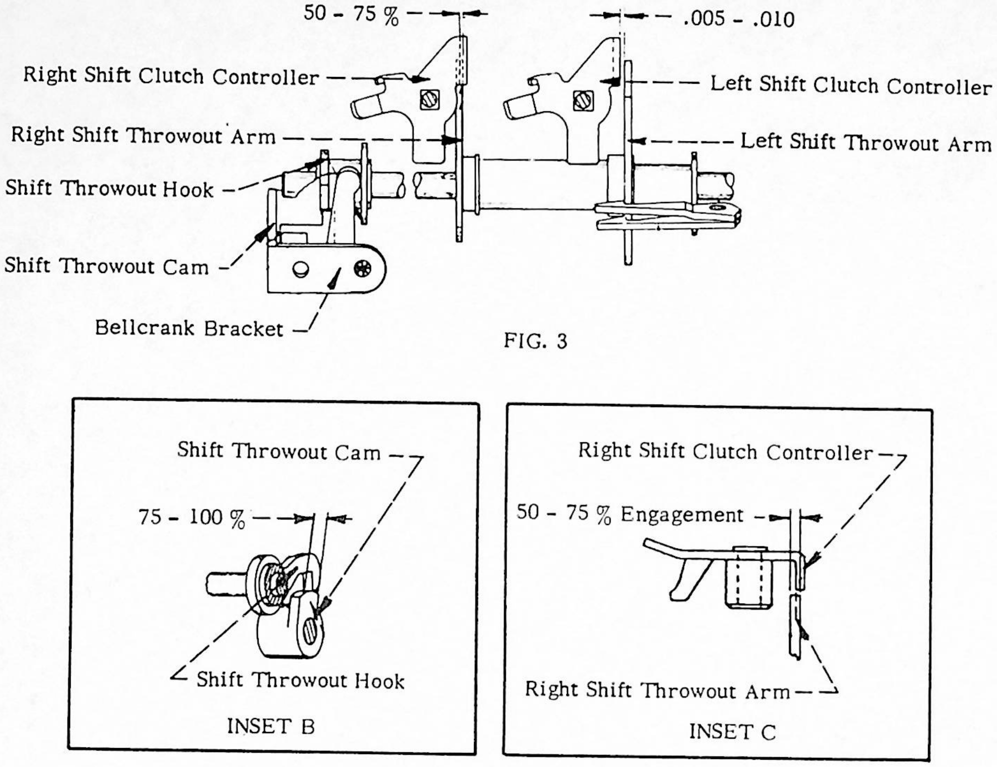


FIG. 3

FIG. 3 - ENGAGEMENT OF RIGHT SHIFT THROWOUT ARM

With the carriage clear, manually cycle the machine in division until the 2nd right shift has caused the right shift throwout arm to engage and actuate the right shift clutch controller (auxiliary latch and lower aligner latch delatched). Then check and adjust as follows:

1. The left shift throwout arm is to clear the left shift clutch controller by .005" to .010". Also, the shift throwout cam is to engage the shift throwout hook with a 75% to 100% bite (Inset B). To adjust, form the bellcrank bracket up or down as required.

2. The right shift throwout arm is to engage the right shift clutch controller with a 50% to 75% bite (Inset C). To adjust, form the right shift throwout arm.

ADJ. 4 - CARRIAGE SHIFT (Cont.)

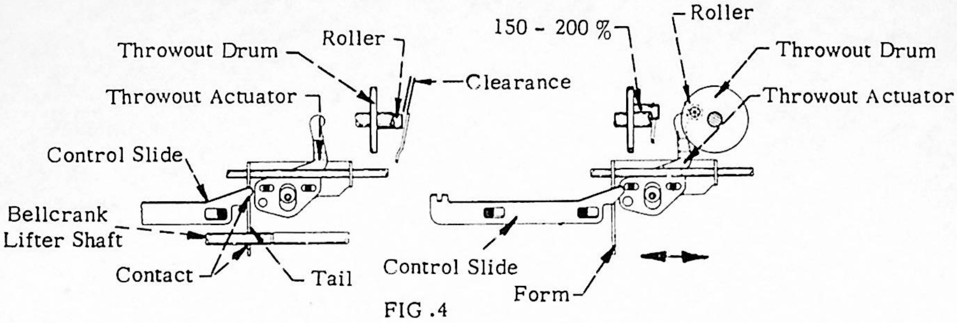


FIG. 4 - ENGAGEMENT OF THROWOUT ACTUATOR

1. With the machine in home position: the upper end of the throwout actuator is to have clearance to the roller on the throwout drum, while the tail is contacting the control slide and the bellcrank lifter shaft as shown.

2. With the machine cycled in division until the lower aligner latch is delatched and the division control gear is in home position, the control slide is to hold the upper end of the throwout actuator engaged on the throwout drum roller with a 150% to 200% bite.

To adjust, form the throwout actuator tail.

ADJ. 5 - DIVISION ALIGNMENT

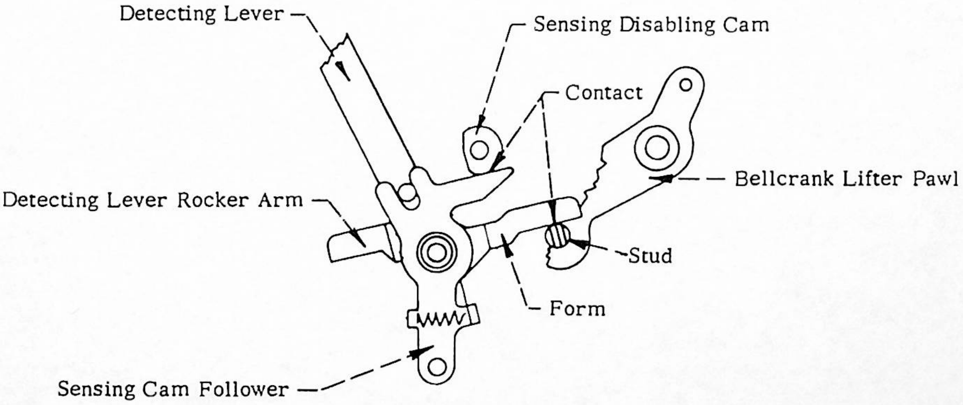


FIG. 1

FIG. 1 - BELLCRANK LIFTER PAWL

With the machine in home position and the division control gear restored over its stop pin, the sensing cam follower is to contact the sensing disabling cam. Also, the stud on the bellcrank lifter pawl is to contact the detecting lever rocker arm. To adjust, form the detecting lever rocker arm at point indicated.

Continued on Next Page

ADJ. 5 - DIVISION ALIGNMENT (Cont.)

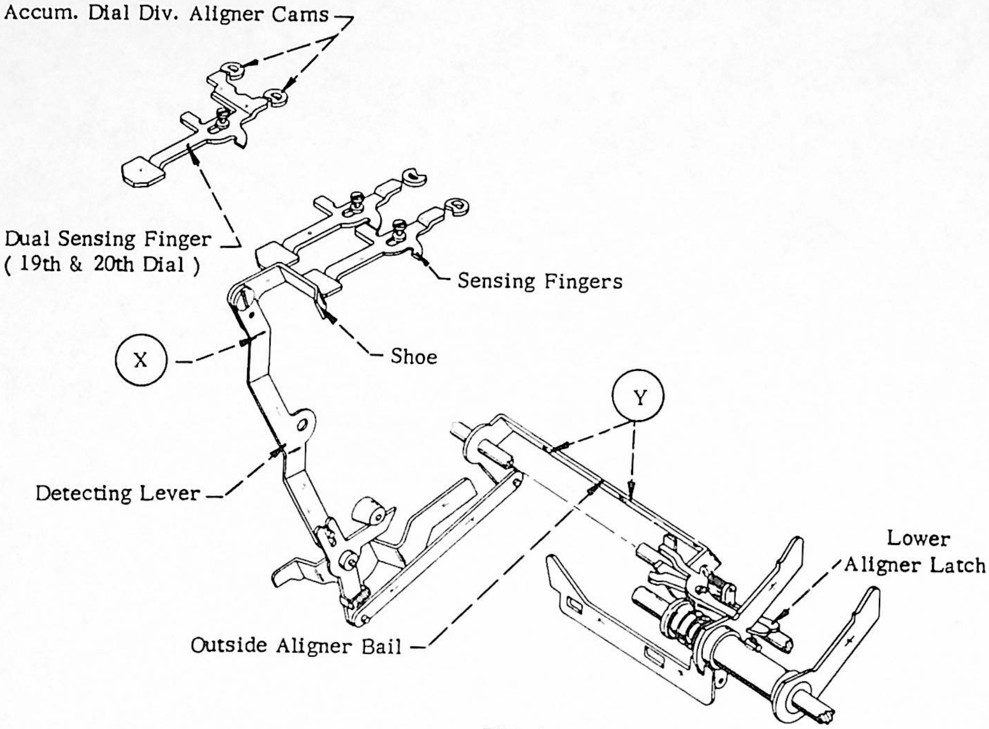


FIG. 2

FIG. 2 - DELATCHING OF THE LOWER ALIGNER LATCH

1. With the machine in home position, the outside aligner bail is to have no pressure against the lower aligner latch and cause it to be partially delatched. To adjust, form the detecting lever at point X.
2. With a "5" turned in the 18th accumulator dial and a figure selected in the 10th column of the main keyboard, cycle the machine under power in division. As the carriage shifts to the right in division alignment, the detecting lever is to move in and delatch the lower aligner latch just as the shoe on the detecting lever aligns with the 19th dial. To adjust, form the outside aligner bail at point Y.

ADJ. 5 - DIVISION ALIGNMENT (Cont.)

FIG. 3 - INSIDE ALIGNER BAIL

With the carriage and the keyboard clear, manually cycle the machine in division until the hook on the shift throwout cam follower is positioned on the high lobe of the shift throwout cam as shown in the Inset. In this position, the inside aligner bail is to have .005" to .010" movement between the upper aligner latch and the stud on the connector arm. To adjust, form the inside aligner bail as required.

Note: With the machine in a minus transfer (not division), the stud on the connector arm is not to contact the inside aligner bail.

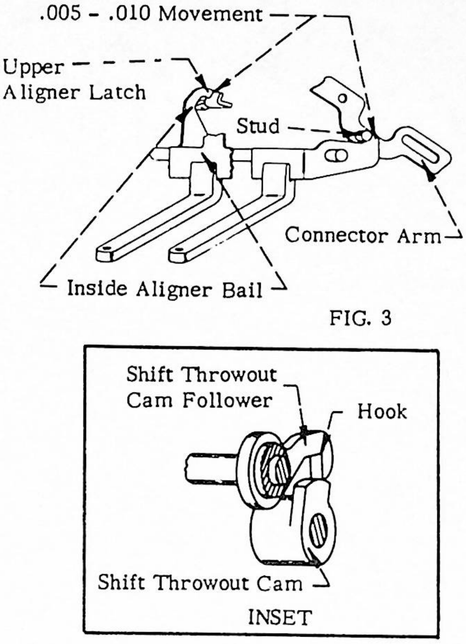


FIG. 3

FIG. 4 - ALIGNER DISABLING ARM

With the keyboard clear, cycle the machine under power in division until the carriage has shifted to the extreme right. At this point, the shift gear is to actuate the left override pawl and cause the inside aligner bail to unlatch the upper aligner latch. To adjust, form the inside aligner bail at point indicated.

Note: With the machine in home position, the aligner bail is not to be held rotated.

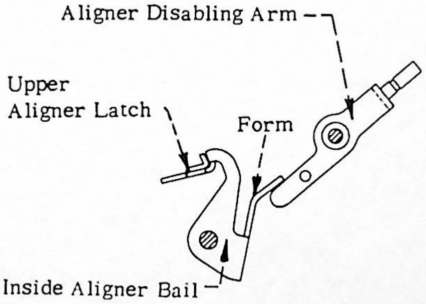


FIG. 4

ADJ. 6 - DIVISION STOP

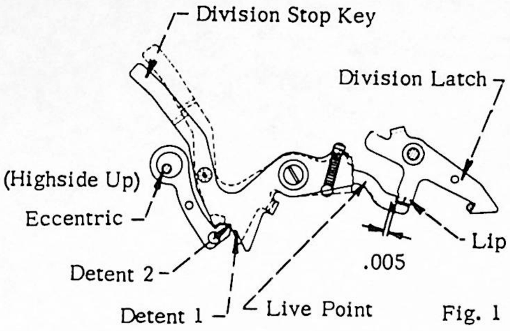


FIG. 1 - DIVISION STOP LEVER DETENT

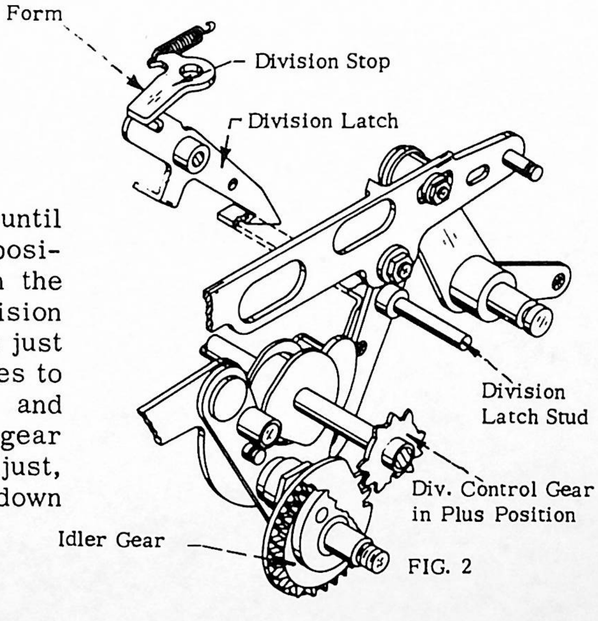
1. The division stop key is to fully detent into either of its two detent positions. With the division stop key pulled forward and the machine cycled in plus and minus, the key is not to "creep" back up. To adjust, turn the eccentric, keeping the high side up and to the rear.

2. With the division stop key moved forward into detent 2, cycle the machine in division until the division control gear is rotated to the "plus" position as shown in Fig. 2. At this point, the live point is to engage the division latch and have .005" clearance to the front side of the lip. To adjust, form the latch lip forward or rearward as required.

3. With the division stop key pulled forward, the live point is to engage the division latch lip with a 100% bite. To adjust, form the latch lip up or down as required.

FIG. 2 - DIVISION STOP ON CARRIAGE

Cycle the machine in division until the carriage reaches the 1st position and the division stop on the carriage moves behind the division latch. The machine is to stop just as the add-subtract gate moves to the neutral (shift) position and before the division control gear reaches home position. To adjust, form the division stop up or down as required.



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ADJ. 6 - DIVISION STOP (Cont.)

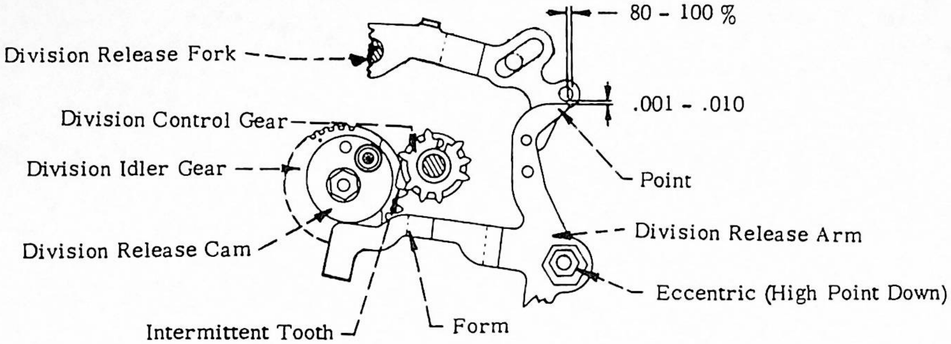


FIG. 3

FIG. 3 - DIVISION RELEASE DELAY ARM

With the keyboard clear, manually cycle the machine in division for three cycles. This will delatch the auxiliary latch and position the add-subtract gate to the subtract position. Continue to cycle the machine until the division control gear starts to move out. Then, just as the first intermittent tooth on the division idler gear contacts the division control gear, there is to be .001" to .010" clearance between the point on the division release arm and the stud on the division release fork, as well as an 80% to 100% engagement. To adjust, turn the eccentric, keeping the high side down and to the rear. Note: It may be necessary to form the division release arm to obtain the proper engagement.

NOTES

ADJ. 7 -AUTOMATIC DIVISION STOP

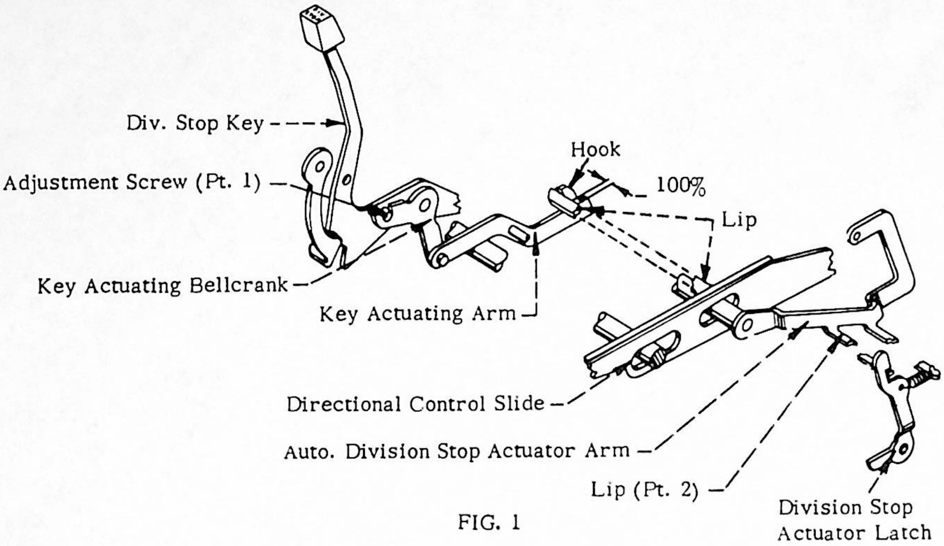


FIG. 1

FIG. 1 - KEY ACTUATING ARM

With the auto division stop actuator arm held down, depress the plus bar and cycle the drive shaft until the add-subtract gate is fully positioned rearward. At this point, the division stop key is to be fully forward, but not bottomed. Also, the hook on the key actuator arm is to be flush (100% engagement) with the top edge of the lip on the directional control slide. To adjust, loosen the adjustment screw (Pt. 1), and move the key actuating bellcrank until the hook is free to move up and down behind the lip. Then form the lip (Pt. 2) for the 100% engagement of the hook.

ADJ. 7 - AUTOMATIC DIVISION STOP (Cont.)

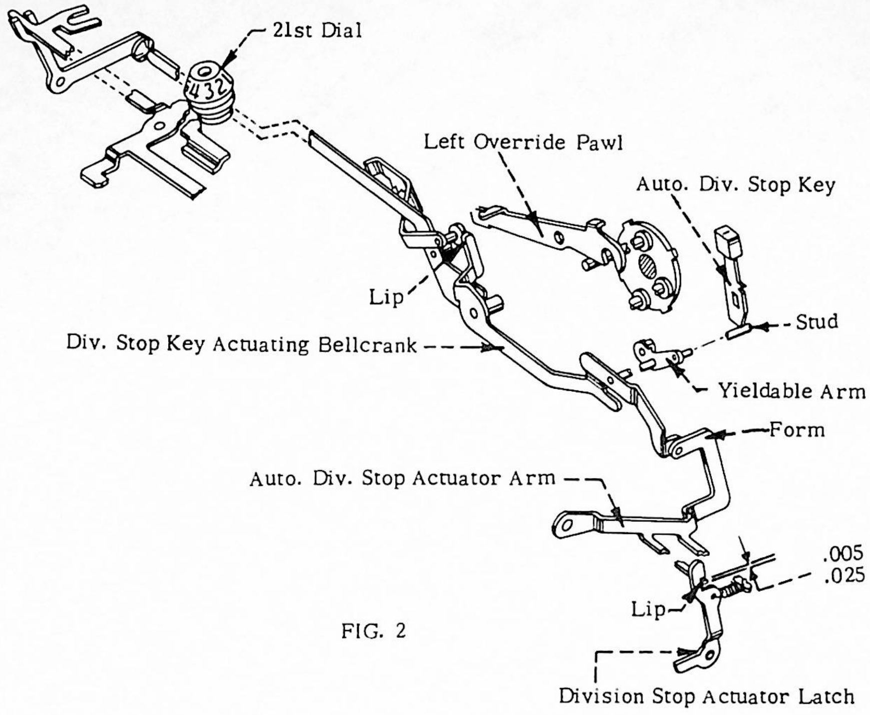

21st Dial
432
Left Override Pawl
Auto. Div. Stop Key
Lip
Stud
Div. Stop Key Actuating Bellcrank
Yieldable Arm
Form
Auto. Div. Stop Actuator Arm
.005
.025
Lip
Division Stop Actuator Latch

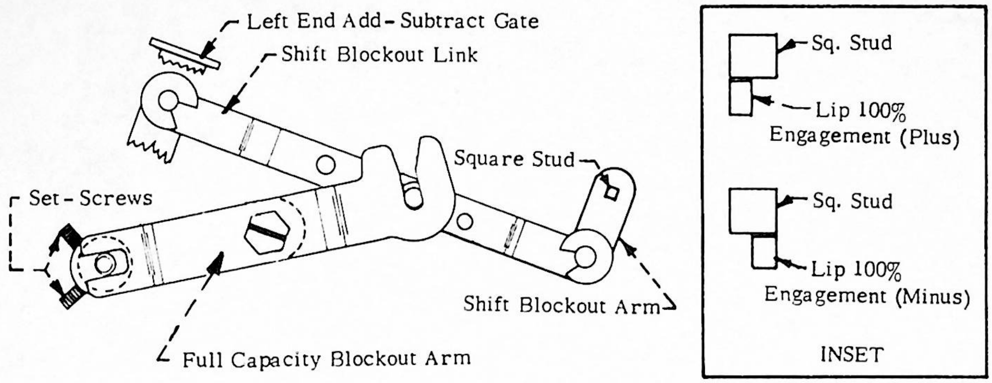
FIG. 2

FIG. 2 - OVERLATCH FOR AUTO DIVISION STOP ACTUATOR ARM

With a number in the 21st dial, check the auto division stop by cycling the machine in division until the left override occurs. At this point: the lip on the auto division stop actuator arm is to overlatch the division stop actuator latch by .005" to .025". To adjust, form the lip on the division stop key actuating bellcrank. Note: With the 21st dial at "0" and a number in the 20th dial, the machine is to divide out in the normal manner. If it stops when the override occurs, readjust the lip on the division stop key actuating bellcrank.

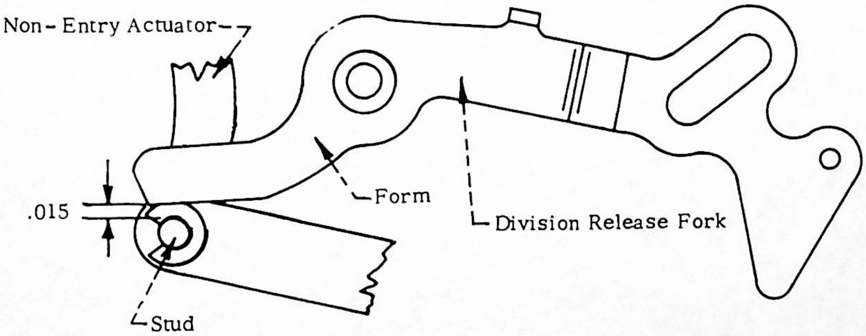
On machines with the automatic division stop keys, cycle the machine in division until the depressed auto division stop key contacts the stud on the yieldable arm. At this point, the lip on the auto division stop actuator arm is to overlatch the division stop actuator latch by .005" to .025". To adjust, form the upper end of the auto division stop actuator arm at point indicated.

ADJ. 8 - FULL CAPACITY DIVISION BLOCK


Left End Add-Subtract Gate
Shift Blockout Link
Square Stud
Set-Screws
Shift Blockout Arm
Full Capacity Blockout Arm
Sq. Stud
Lip 100% Engagement (Plus)
Sq. Stud
Lip 100% Engagement (Minus)
INSET

1. When the division keys are depressed, the stud on the shift blockout link is to be bottomed in the slot on the full capacity blockout arm. To adjust, rotate the full capacity blockout arm on its shaft, and tighten the set-screws.
2. In either the plus or minus position of the add-subtract gate in division, the lip on the full carry-over engaging actuator is to have a full 100% engagement with the underside of the square stud on the shift blockout arm. To adjust, move the full capacity blockout arm forward or rearward as required.

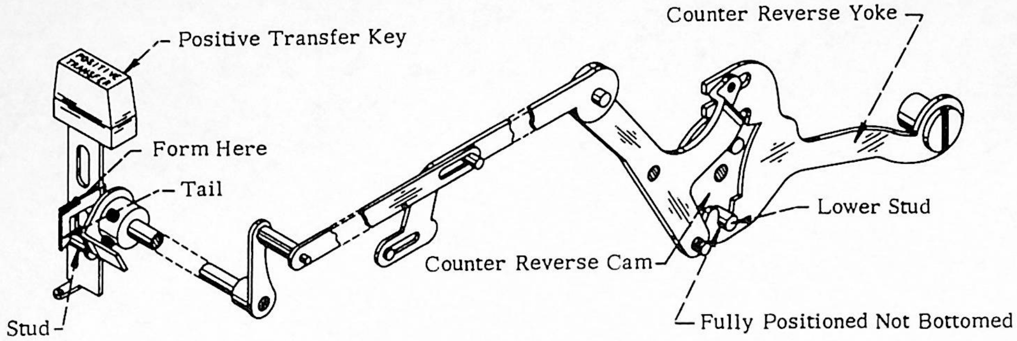
ADJ. 9 - COUNTER BLOCKOUT FOR DIVISION



With the machine in home position and the non-entry key pulled forward, there is to be approximately .015" clearance between the tail on the division release fork and the stud on the non-entry actuator. To adjust, form the tail on the division release fork.

SELECTIVE TRANSFER

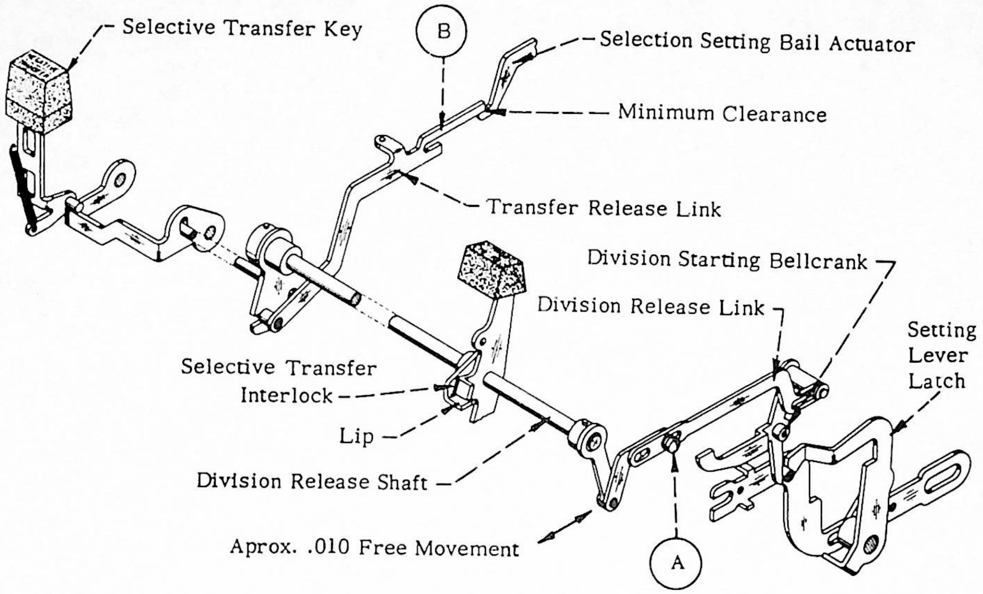
ADJ. 1- ENGAGEMENT OF THE COUNTER REVERSE YOKE



When the positive transfer key is depressed, the counter reverse yoke is to be fully positioned on the lower stud of the counter reverse cam, but not bottomed. To adjust, form the tail on the positive transfer key. Note: Before making this adjustment, check the "Counter Control Key" adjustment under counter adjustments in Section 7.

NOTES

ADJ. 2 - DIVISION RELEASE LINK AND TRANSFER RELEASE LINK



1. With the machine in home position, the division release link is to have approximately .010" free movement. To adjust, shorten or lenghten the division release link at screw A.

2. With the machine in home position, there is to be minimum clearance between the transfer release link and the selection setting bail actuator. Also, the transfer release link is to be free to move over the selection setting bail actuator. To adjust, form the transfer release link at point B.

3. Following a back transfer operation (product-to-keyboard key latched forward), the selective transfer keys are to be interlocked. To adjust, form the lip on the selective transfer interlock.

NOTES

ADJ. 3 - SELECTING GEAR ENGAGEMENT

FIG. 1 - SELECTION SETTING BAIL ACTUATOR

When either selective transfer key is depressed, the yoke on the selection setting bail actuator is to drop over the stud on the selection setting bail far enough rearward so the selecting gear being actuated will have a 75% engagement with its #1 segment. To adjust, move the selection setting bail actuator forward or rearward as required.

NOTE: After adjusting the yoke for the selecting gear engagement, check to see that it doesn't bind or hang-up when moving on or off the stud.

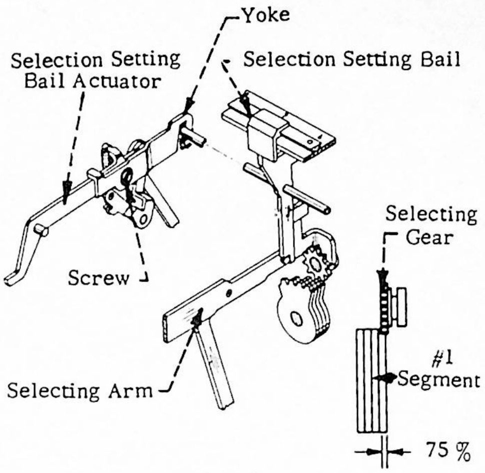
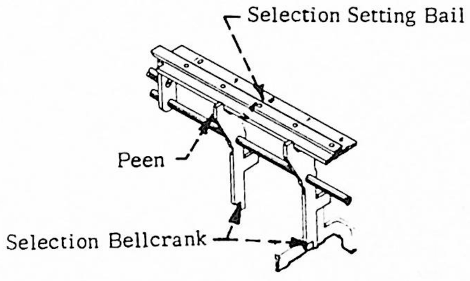


FIG. 1

INSET - SELECTION BELLCRANKS

If one selecting arm is not getting a proper selection, peen the selection bellcrank at point indicated as shown in the Inset.



INSET

FIG. 2 - DISENGAGING BELLCRANK

With either selective transfer key depressed, cycle the drive shaft until the division control gear has made one complete revolution. At this point, the roller on the disengaging bellcrank is to have .005" to .015" clearance to the underside of the selection setting bail actuator. To adjust, form the disengaging bellcrank. After adjusting, recheck Adj. 2, paragraph 2.

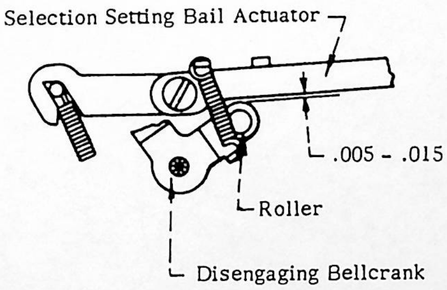


FIG. 2

ADJ. 1 - SELECTION AND ESCAPEMENT

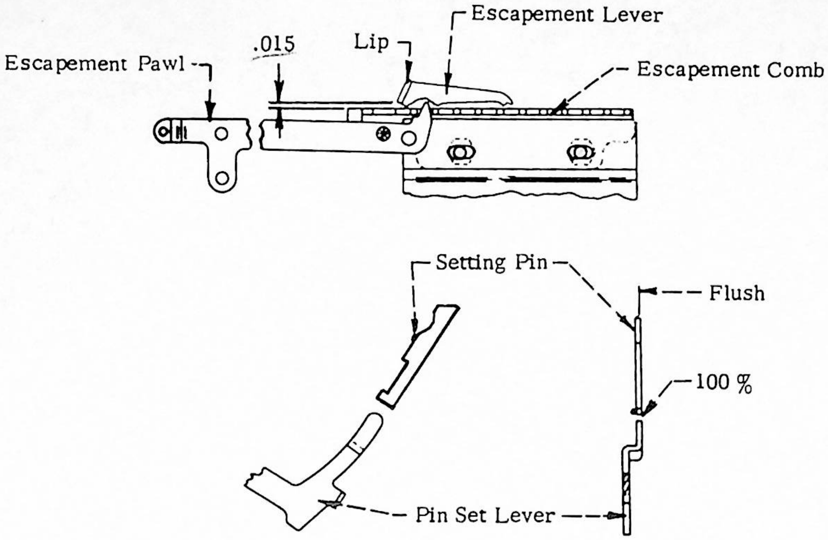


FIG. 1

FIG. 1 - ALIGNMENT OF THE SETTING PINS TO PIN SET LEVERS

When aligning the setting pins to the pin set levers, escape the mult unit 9 places to the left so the setting pins in the 10th column are over the pin set levers. Then align the setting pins by shifting the escapement comb to the right or left. When properly aligned, the pin set levers are to have a 100% engagement with the setting pins. Keep the escapement comb level with approximately .015" clearance between the comb and the lip on the escapement lever.

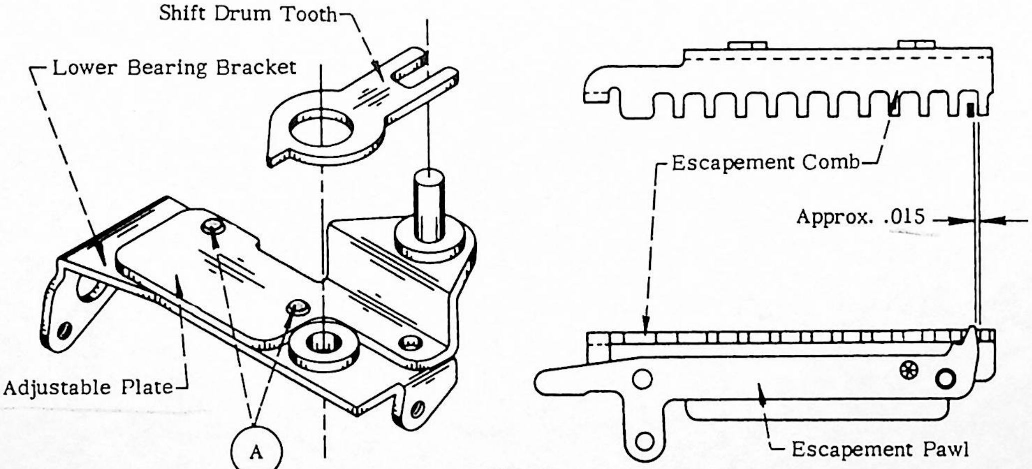


FIG. 2

FIG. 2 - UNIT SHIFT RACK

When the mult unit is shifting to the right, the tooth on the escapement comb is to overtravel the escapement pawl by approximately .015". To adjust, loosen the screws A on the shift drum lower bearing bracket and move the adjustable plate right or left.

Continued On Next Page

ADJ. 1 - SELECTION AND ESCAPEMENT (Cont.)

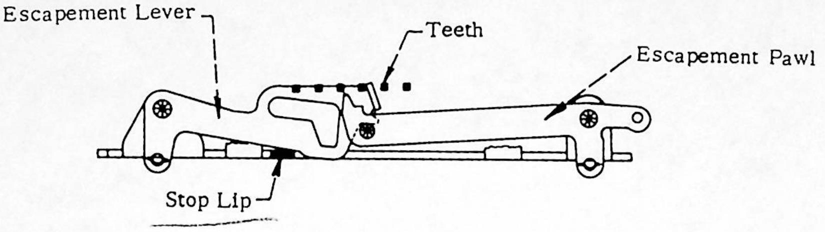


FIG. 3

FIG. 3 - STOP LIP

The stop lip is to stop the downward travel of the escapement lever just as the point of the escapement pawl releases from the comb tooth. Test in each position by depressing the zero key. To adjust, raise or lower the stop lip.

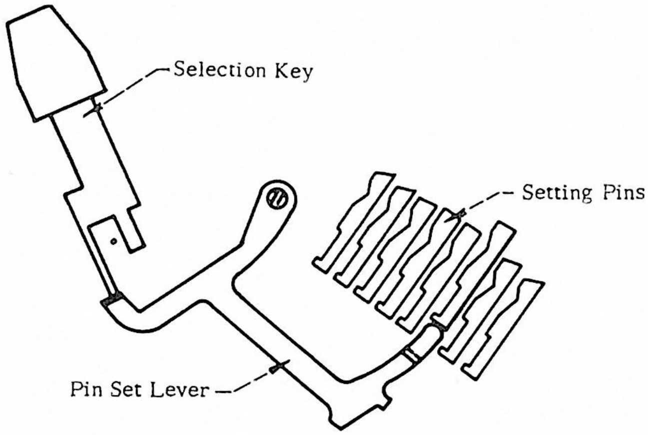


FIG. 4

FIG. 4 - POSITIONING OF THE SETTING PINS

As each mult selection key is fully depressed, the setting pin over the pin set lever is to be raised to its full detent position without bottoming the pin set lever. To adjust, form the pin set lever.

ADJ. 1 - SELECTION AND ESCAPEMENT (Cont.)

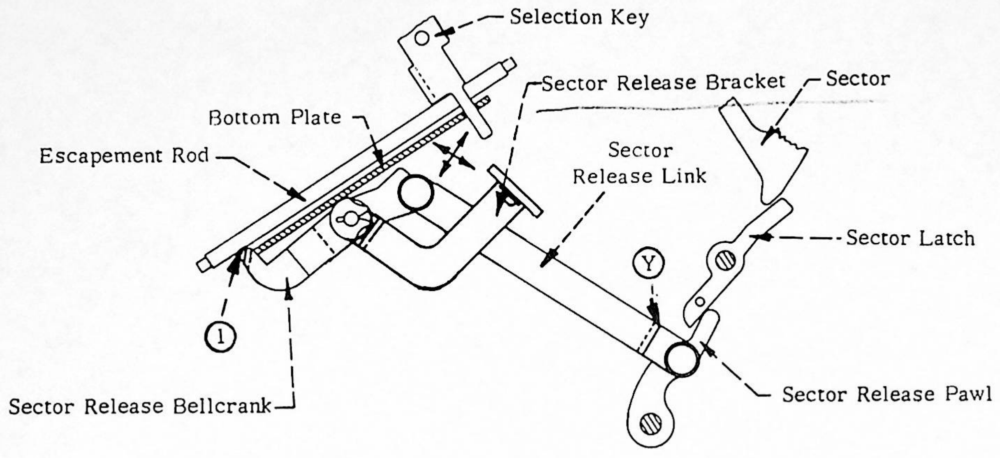


FIG. 5

FIG. 5 - SECTOR RELEASE

When the sector release pawl is manually rotated counter clockwise as far as it will go, point 1 on the sector release bellcrank is to move slightly below the top surface of the bottom plate, but is not to catch below the plate. To adjust, move the sector release bellcrank bracket. Then to obtain the sector release after the pin set and before the unit hop, form the sector release link at point Y.

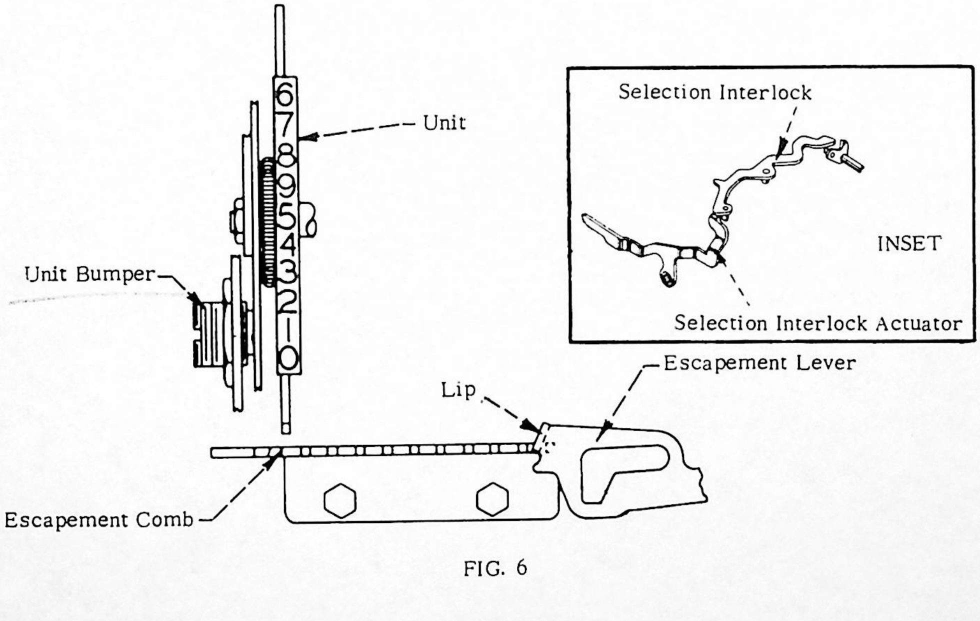


FIG. 6

FIG. 6 - UNIT BUMPER

When the mult unit is escaped to the extreme left and a selecting key is repeatedly depressed (interlock shown in inset held out of the way), the lip on the escapement lever is to move in and out of the escapement comb without hanging up. To adjust, move the unit bumper in or out as required.

Continued On Next Page

ADJ. 1 - SELECTION AND ESCAPEMENT (Cont.)

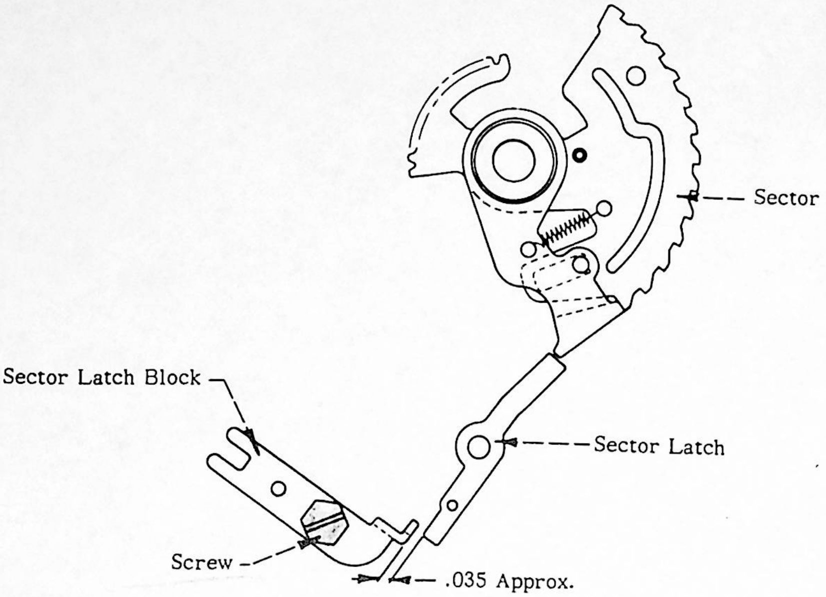


FIG. 7

FIG. 7 - SECTOR LATCH BLOCK

With the sectors all latched on their sector latches, escape the unit to the left. As the unit moves to the left, there is to be approximately .035" clearance between the sector latch block and the sector latches. To adjust, move the sector latch block.

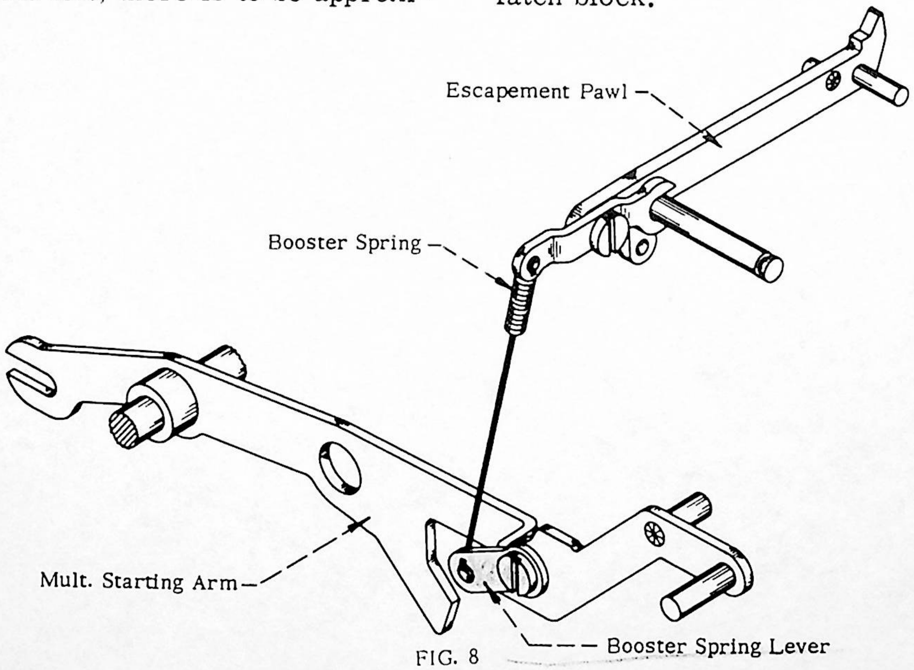
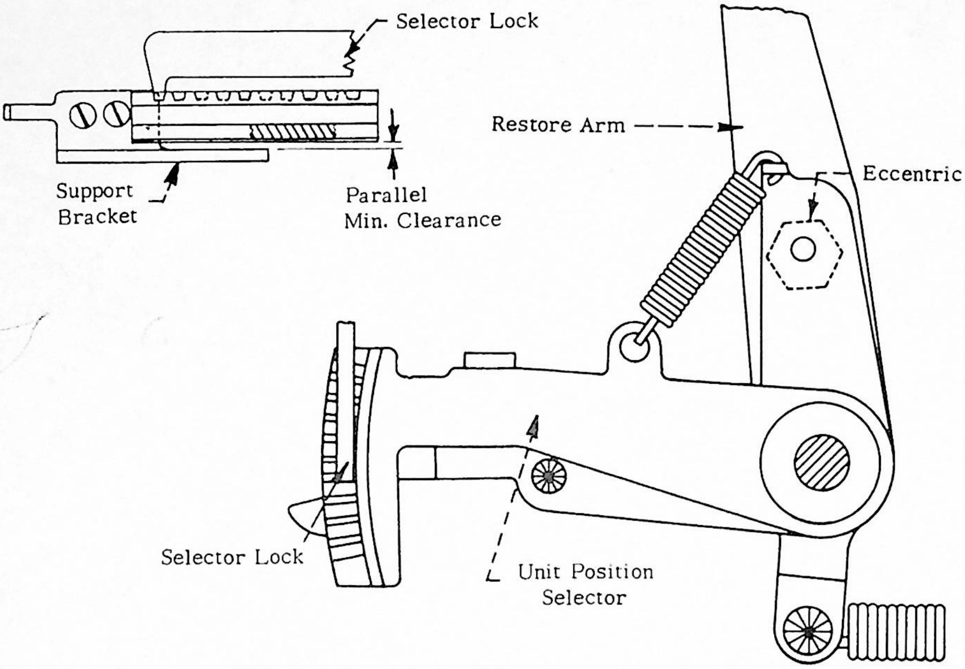


FIG. 8

FIG. 8 - ESCAPEMENT PAWL BOOSTER SPRING

With the machine and the mult unit in home position, the booster spring is to be set as loose as possible. To adjust, rotate the booster spring lever as required; and tighten the holding screw.

ADJ. 2 - UNIT POSITION SELECTOR (REPEAT MULT)

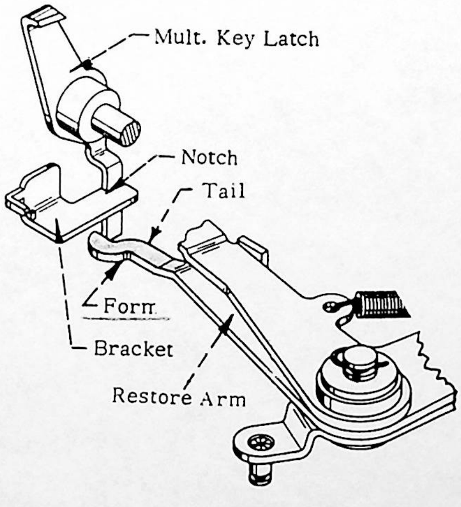


With the mult unit escaped one or more positions out of the home position, pull the repeat key forward to engage the selector lock into a tooth space on the unit position selector. At this point:

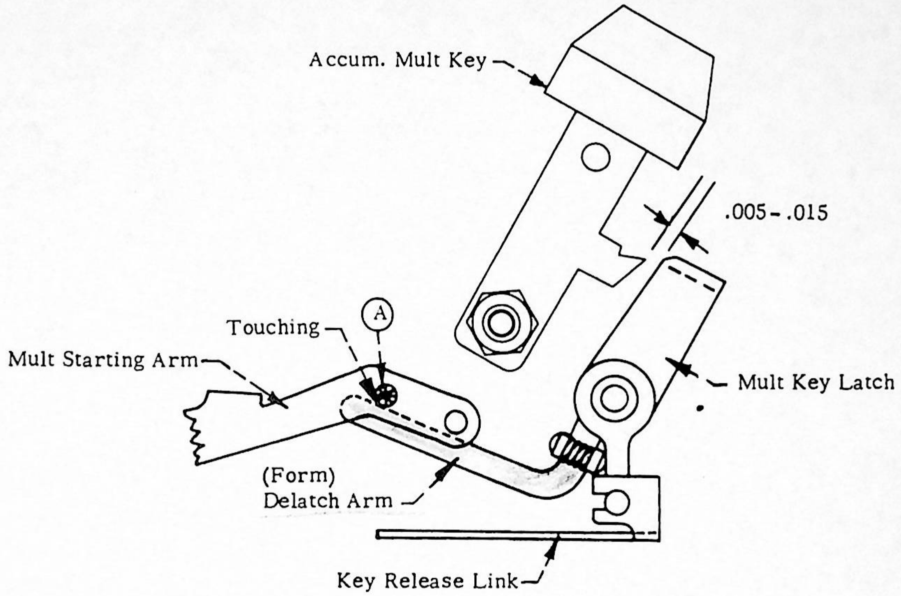
1. The support bracket is to be parallel with, but have minimum clearance to, the bottom surface of the unit position selector. To adjust, move the bracket. After adjusting, check to see that the unit position selector does not drag or bind on the bracket.
2. As the selector lock enters a tooth space, the unit position selector is to have maximum rearward movement without causing a hard repeat key action. To adjust, turn the eccentric on the restore arm.

ADJ. 3 - MULT KEY RELEASING

With the mult unit in home position, the lower end of the mult key latch is to rest against the notch on the support bracket; and also contact the tail on the restore arm. To adjust, form the tail on the restore arm at point indicated.



ADJ. 4 - KEYLATCH OVERTRAVEL



When the keyboard hold key is depressed and any mult operating key is sharply depressed, the keyboard hold key is to remain latched. To adjust, form the delatch arm at point indicated so the mult key latch lips have approximately .005" to .015" clearance when the key latch shaft is held manually rotated, and the delatch arm is just touching stud A.

ADJ. 5 - MULT INITIATOR SHAFT

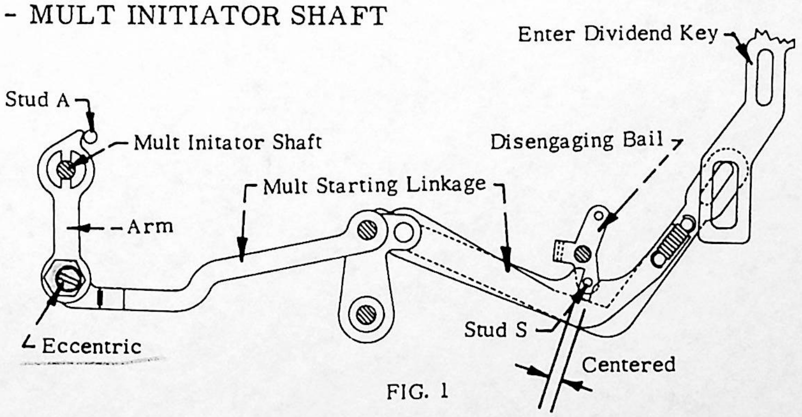


FIG. 1

FIG. 1 - DISENGAGING BAIL ENGAGEMENT

With the arm on the right end of the mult initiator shaft rotated against stud A, stud S on the disengaging bail is to be centered in the slot on the mult starting linkage. To adjust, turn the eccentric.

Continued on Next Page

ADJ. 5 - MULT INITIATOR SHAFT (Cont.)

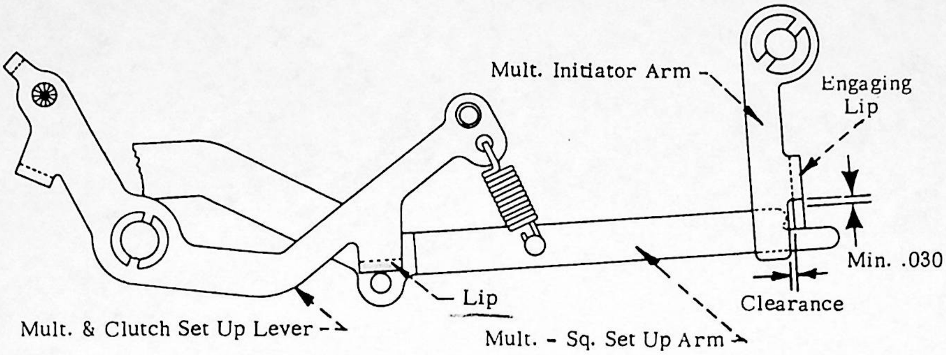
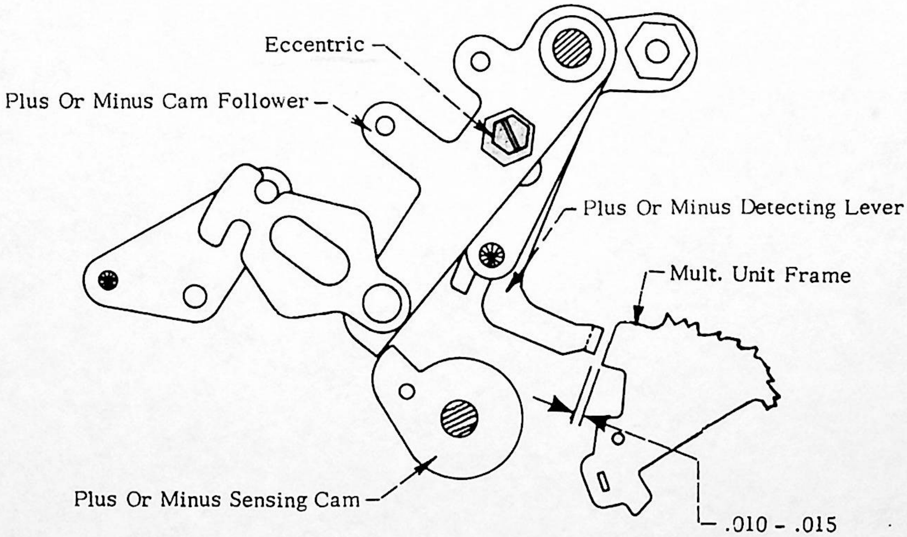


FIG. 2

FIG. 2 - MULT INITIATOR ARM

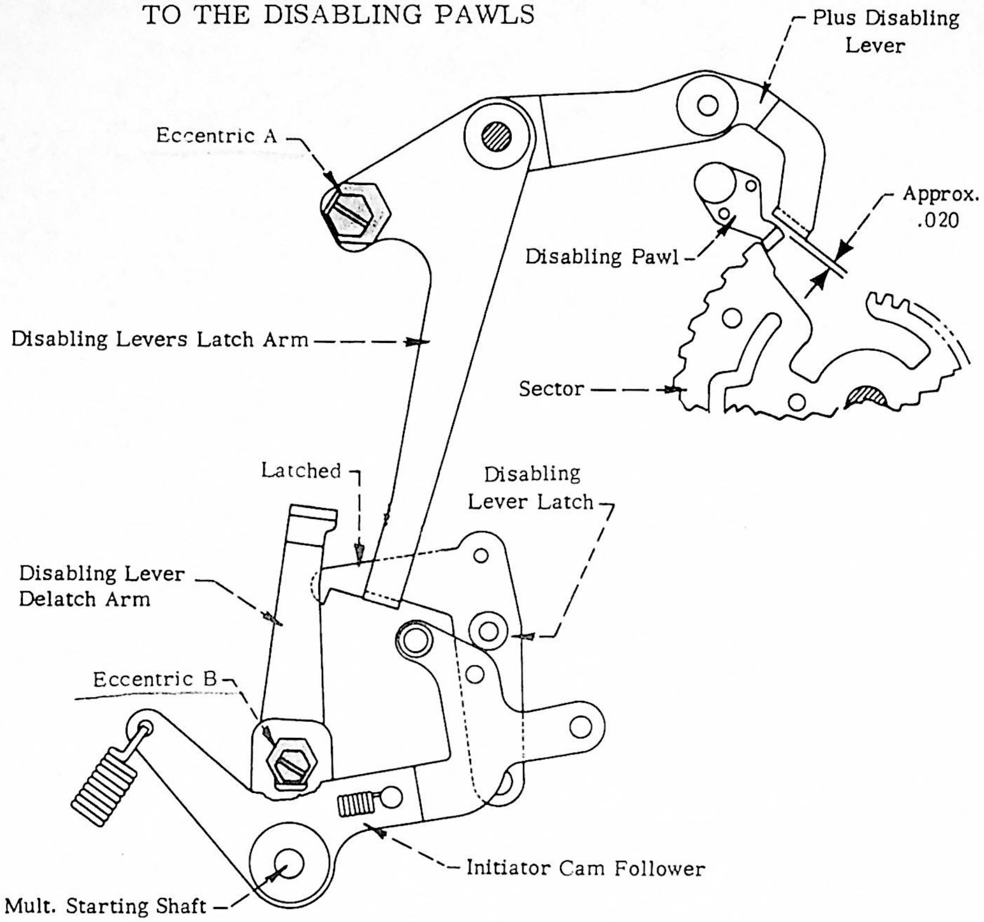
1. With the machine in home position, there is to be .030" minimum clearance between the engaging lip on the mult initiator arm and the top surface of the mult-squaring set-up arm. To adjust, form the lip on the mult and clutch set-up lever.
2. When the mult sq. operating keys are depressed, the mult-squaring set-up arm is to move behind the engaging lip on the mult initiator arm without dragging against the lip. To adjust, form the mult initiator arm.

ADJ. 6 - PLUS OR MINUS DETECTING LEVER CLEARANCE TO MULT UNIT FRAME


Eccentric
Plus Or Minus Cam Follower
Plus Or Minus Detecting Lever
Mult. Unit Frame
Plus Or Minus Sensing Cam
.010 - .015

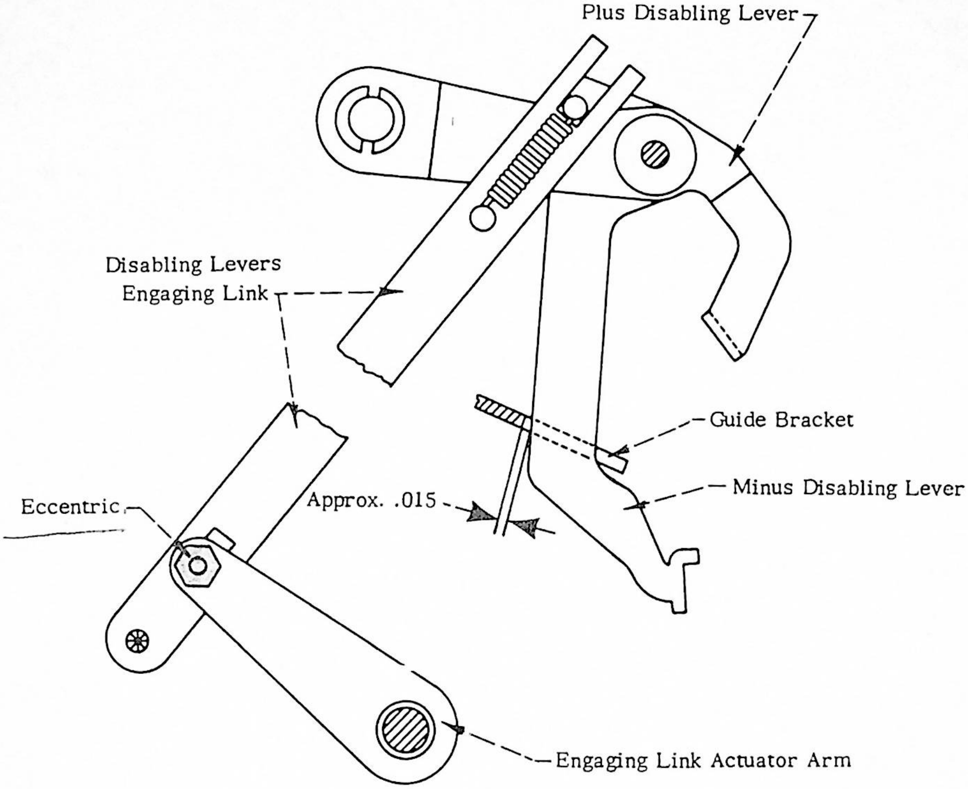
With the mult unit in home position and the plus or minus cam follower resting on the high point of the plus or minus sensing cam, the plus or minus detecting lever is to have .010" to .015" clearance to the mult unit frame at point shown. To adjust, turn the eccentric on the plus or minus cam follower.

ADJ. 7 - PLUS DISABLING LEVER CLEARANCE TO THE DISABLING PAWLS



1. With 3 zeros selected in the mult unit, cycle the drive shaft in mult until the mult unit just starts to shift. Then manually latch the disabling levers latch arm on the disabling lever latch by lifting up on the plus disabling lever. At this point, the plus disabling lever is to have approximately .020" clearance to MAX. the disabling pawls. To adjust, turn the eccentric A.
2. With the machine restored to home position, the plus disabling lever is to have approximately .020" clearance to the disabling pawls. To adjust, turn the eccentric B. Note: Clearance can be checked by selecting zeros in the mult unit.

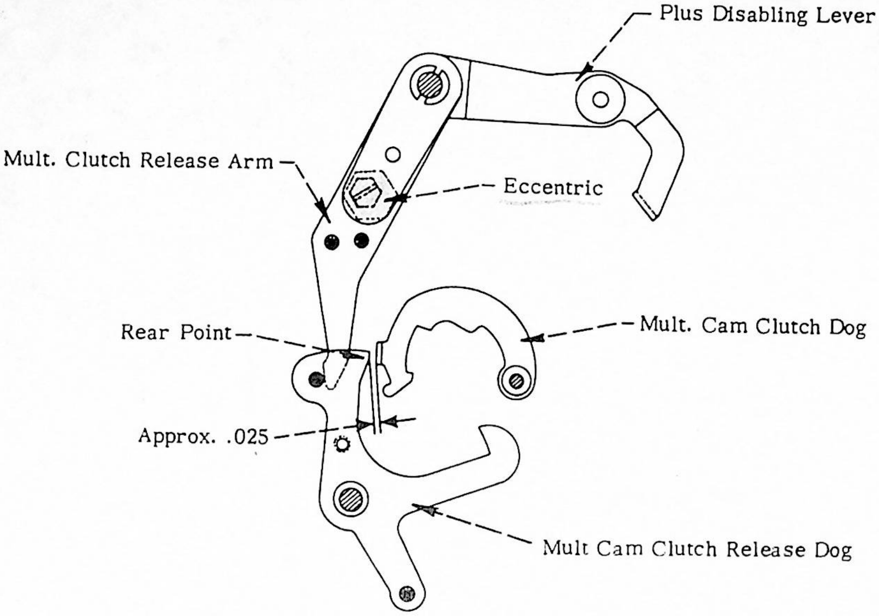
ADJ. 8 - MINUS DISABLING LEVER CLEARANCE TO GUIDE BRACKET



With the mult unit and the drive shaft in home position, the minus disabling lever is to have approximately .015" clearance from bottoming in the slot in the guide bracket. To adjust, turn the eccentric on the engaging link actuator arm.

NOTES

ADJ. 9 - MULT CAM CLUTCH RELEASE DOG

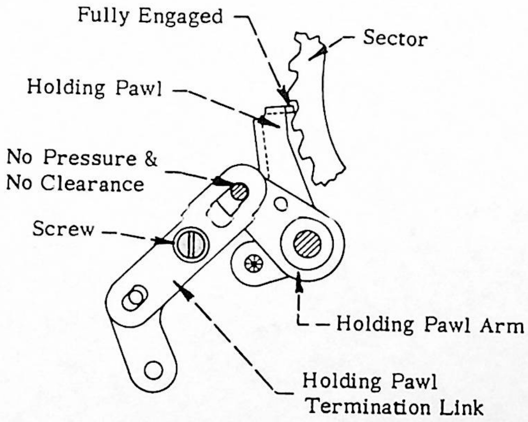


With any number from 1 to 5 selected in the mult unit and the machine cycled in mult until the plus disabling lever drops, the rear point on the mult cam clutch release dog is to have approximately .025" clearance to the lip on the mult cam clutch dog. To adjust, turn the eccentric on the mult clutch release arm.

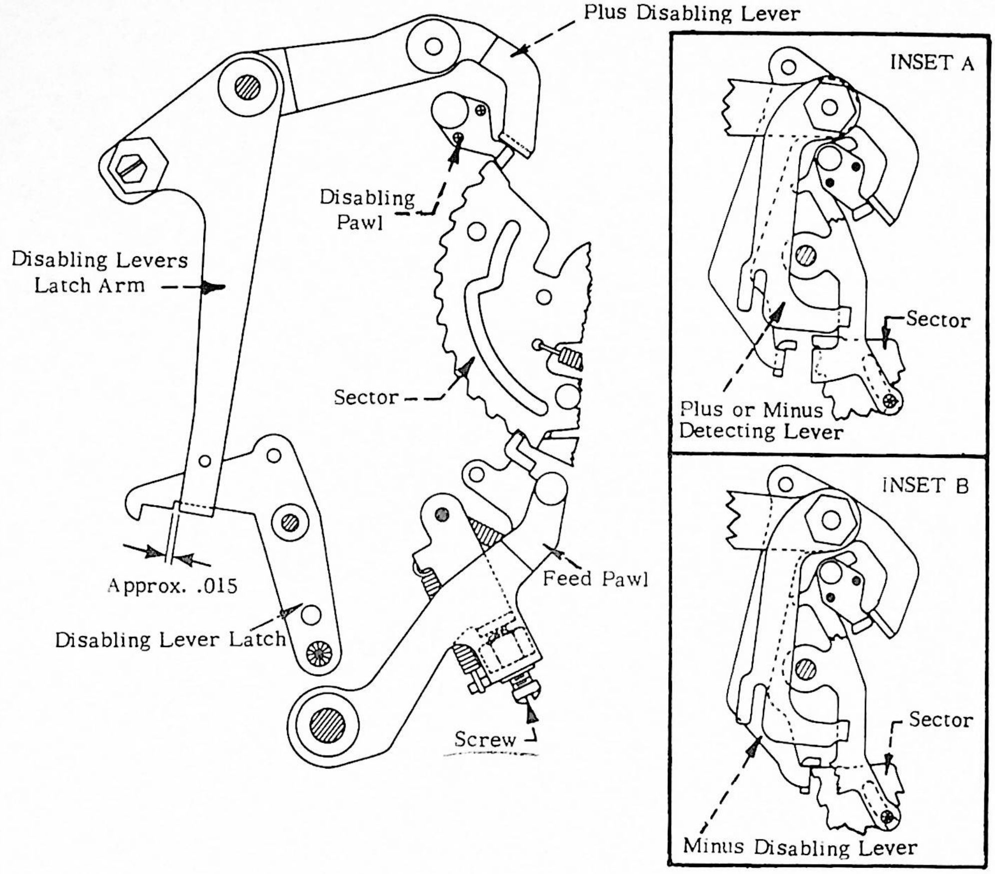
Do adj 11 first

ADJ. 10 - HOLDING PAWL TERMINATION LINK

With any number from 1 to 5 selected in the mult unit, cycle the machine in mult until the holding pawl termination link moves up and the holding pawl moves into full engagement with the sector. At this point, the slot in the holding pawl termination link is to have no pressure and no clearance to the stud on the holding pawl arm. To adjust, move the holding pawl termination link.



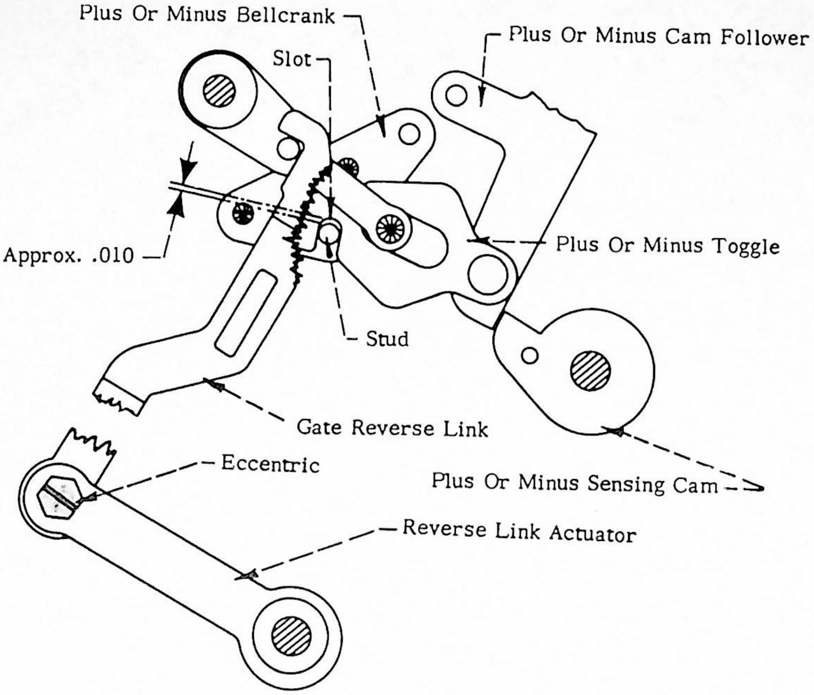
ADJ. 11 - OVERLATCH OF THE DISABLING LEVERS LATCH ARM



With a 1 selected in the mult unit, cycle the machine in mult until the feed pawl raises the sector to its maximum travel. At this point, the disabling levers latch arm is to have approximately .015" overlatch on the disabling levers latch. To adjust, turn the screw on the bottom of the feed pawl.

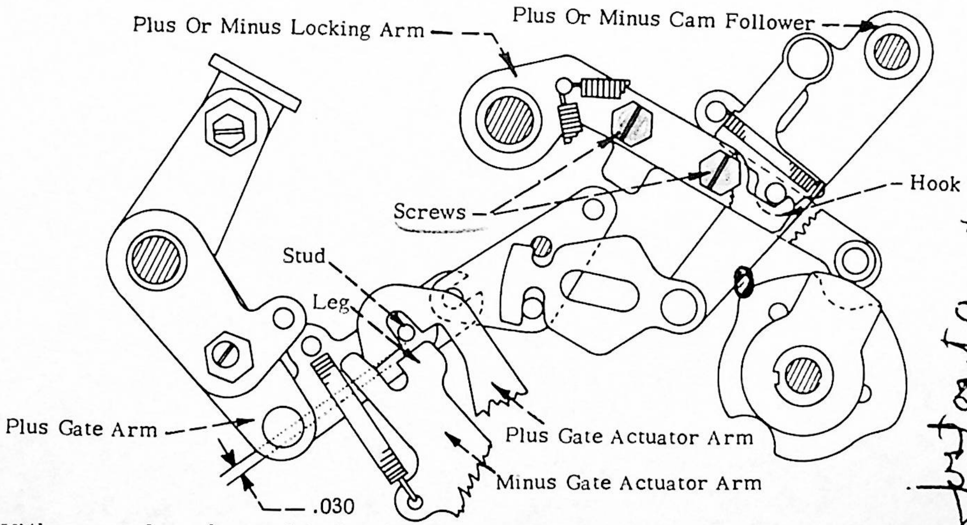
After adjusting the overlatch of the disabling levers latch arm from the plus disabling lever, select two short-cut numbers in the mult unit and recheck the overlatch of the disabling levers latch arm from the plus or minus detecting lever and from the minus disabling lever as shown in Insets A and B.

ADJ. 12 - PLUS OR MINUS TOGGLE



With a number selected in the mult unit, cycle the machine in mult until the gate reverse link moves down (plus or minus cam follower on high point of cam). At this point, the lower slot on the plus or minus toggle is to be approximately .010" short of bottoming on the plus or minus bellcrank stud. To adjust, turn the eccentric on the gate reverse link.

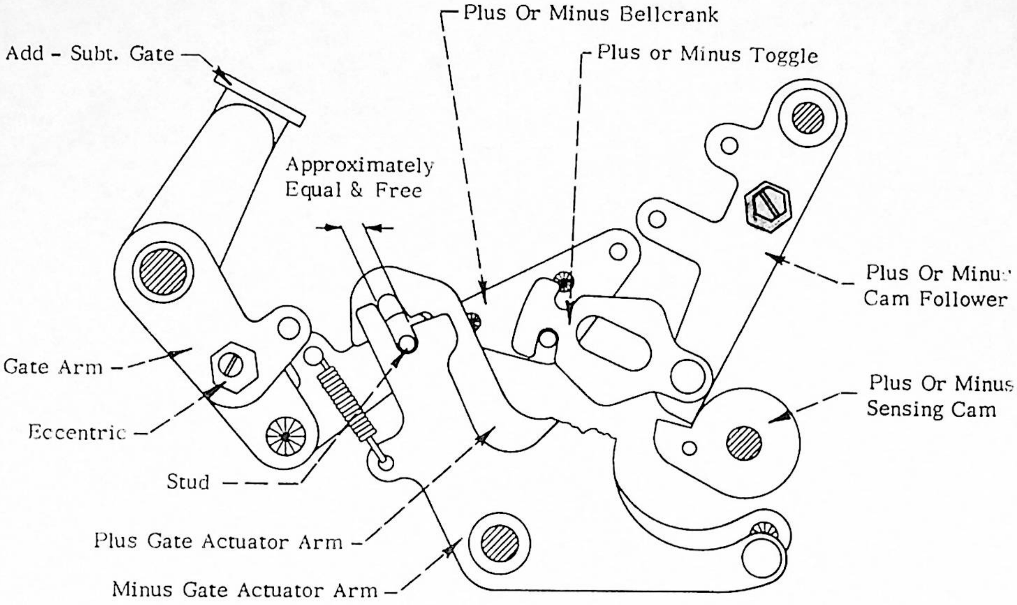
ADJ. 13 - PLUS OR MINUS LOCKING ARM



Just as f Cams to
the high point, 7 Comes to left
1+ [illegible]

With a number from 1 to 5 selected in the mult unit, cycle the machine in mult until the add-subtract gate is moved to the plus position. At this point, the stud on the plus gate arm is to have approximately .030" clearance over the front leg on the minus gate actuator arm. To adjust, move the hook on the plus or minus locking arm forward or rearward as required.

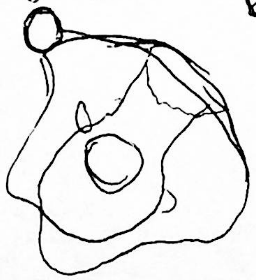
ADJ. 14 - GATE ARM STUD



With any number 6 to 9 selected in the mult unit, cycle the machine in mult until the plus or minus cam follower drops in the low dwell of the plus or minus sensing cam. At this point, the stud on the gate arm is to be approximately centered and free to move up and down in the slots on the gate actuator arms. To adjust, turn the eccentric on the gate arm.

NOTES

at high Point of minus activating Cam Check edge above



ADJ. 15 - RIGHT SHIFT THROWOUT ARM

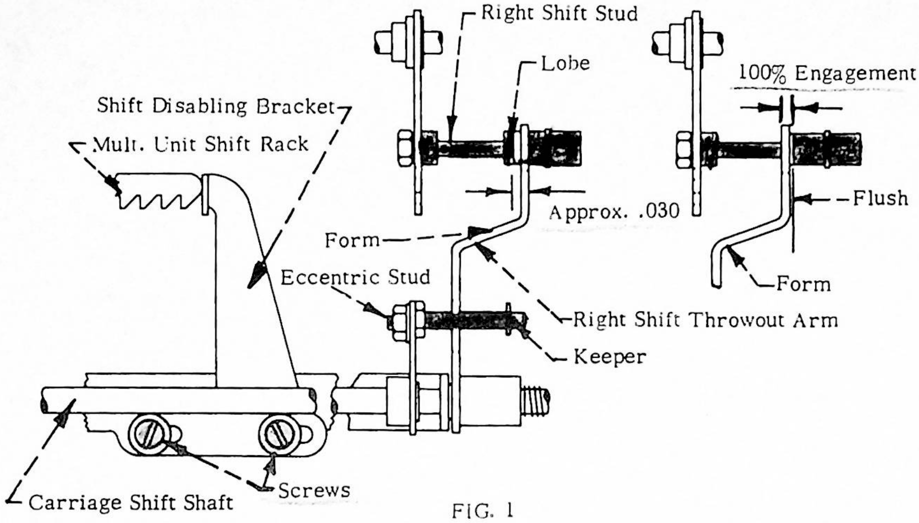


FIG. 1

FIG. 1 - ENGAGEMENT AND DISENGAGEMENT

1. With the mult unit escaped one or more places to the left, the right shift throwout arm is to be flush with the right edge of the lobe on the right shift stud. To adjust, form the right shift throwout arm.

2. With the mult unit in home position, the right shift throwout arm is to have approximately .030" clearance to the right edge of the lobe. To adjust, move the shift disabling bracket.

Note: Always check to see that the keeper is installed on the end of the eccentric stud as shown. This is important because it will prevent the right shift throwout arm from moving off the right shift stud and cause a shift failure.

Continued On Next Page

ADJ. 15 - RIGHT SHIFT THROWOUT ARM (Cont.)

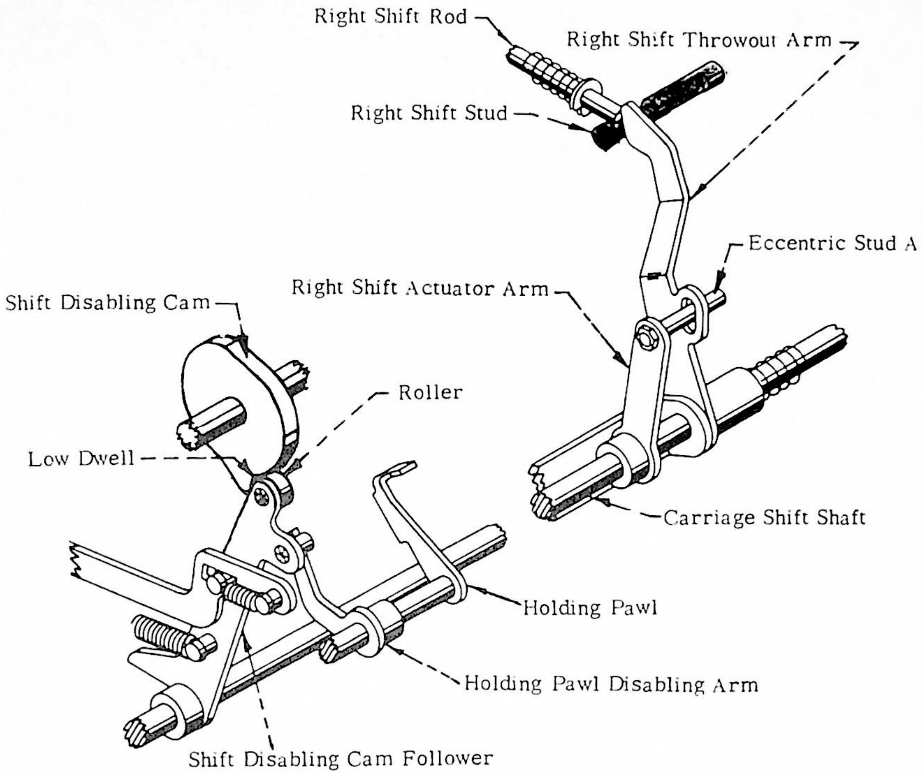


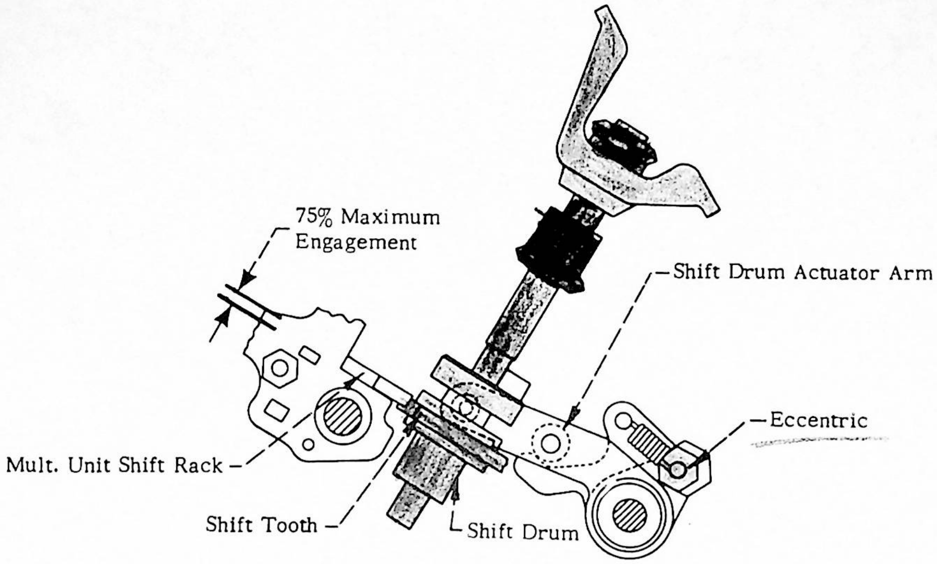
FIG. 2

FIG. 2 - MOVEMENT OF RIGHT SHIFT ROD

With the roller on the shift disabling cam follower resting in the low dwell on the shift disabling cam, the right shift throwout arm is to hold the right shift rod at its maximum rearward position without moving the shift disabling cam follower away from the shift disabling cam. To adjust, turn the eccentric stud A.

After adjusting as above, cycle the machine until the mult termination occurs and the right shift throwout arm moves over the notch on the right shift stud. Then check to see that the right shift throwout arm does not hold the right shift stud rearward.

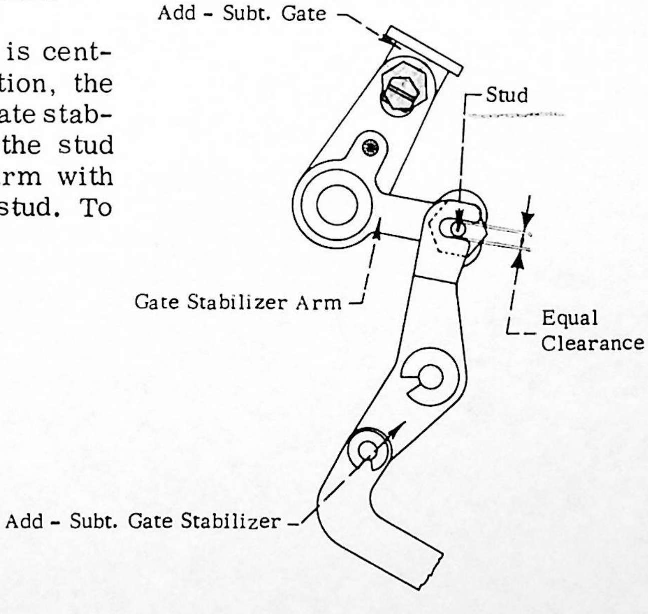
ADJ. 16 - SHIFT TOOTH ENGAGEMENT



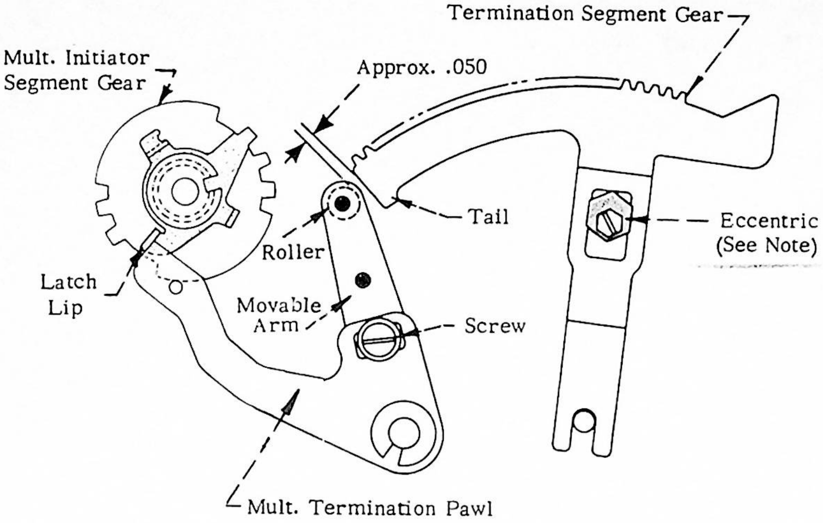
With all zeros selected in the mult unit, cycle the machine in mult until the shift drum raises and engages the shift tooth into mesh with the mult unit shift rack. At this point, the shift tooth is to have a 75% maximum engagement with the shift rack. To adjust, turn the eccentric on the shift drum actuator arm.

ADJ. 17 - GATE STABILIZER

As the add-subtract gate is centralized in a mult operation, the yoke on the add-subtract gate stabilizer is to move over the stud on the gate stabilizer arm with equal clearance to the stud. To adjust, move the stud.



ADJ. 18 - MULT TERMINATION PAWL

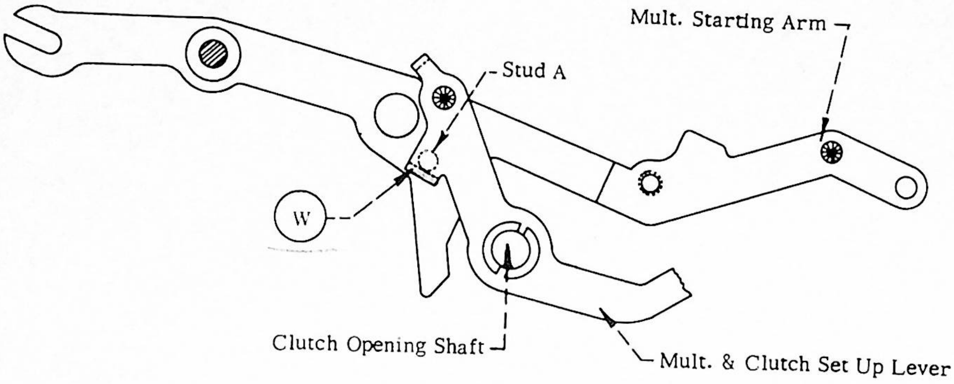


During the last unit shift in mult, the tail on the termination segment gear is to delatch the mult termination pawl from under the latch lip on the mult initiator segment gear just before the mult unit contacts the left side frame. To adjust, have the mult unit in home position and move the mult termination pawl so the roller has approximately .050" clearance to the tail on the termination segment gear. Then check for proper delatching as stated above.

Note: This adjustment will be effected when the termination segment gear eccentric is adjusted for automatic decimal. As a temporary setting, position the eccentric straight up as shown. After making the automatic decimal adjustments, readjust the mult termination pawl for the above conditions.

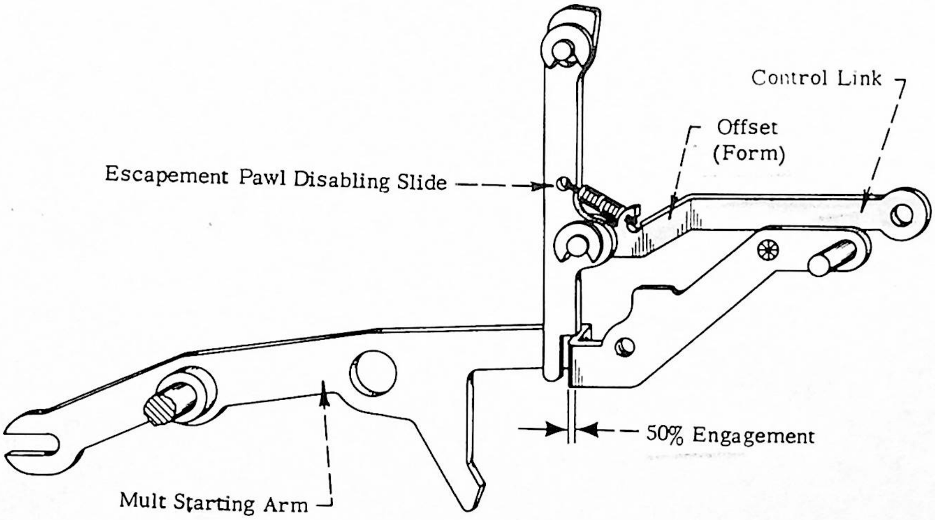
Check adj 4 Figs 8+9 Set 4 before adj 19-

ADJ. 19 ✓CLUTCH OPENING SHAFT



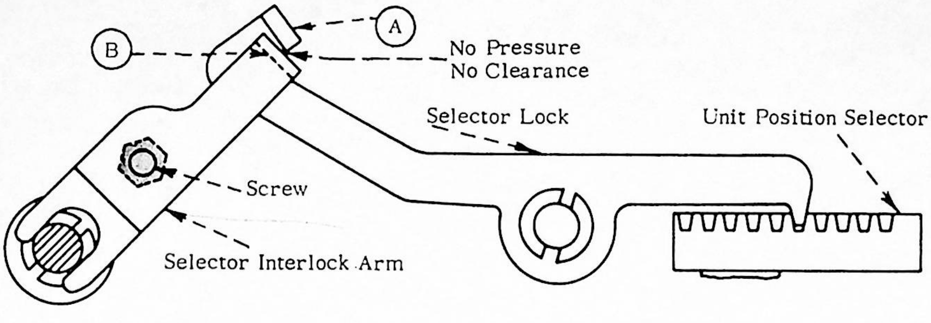
Cycle the machine under power in multiplication until a sector is feeding out and then release the mult key from its latch lip. At this point, the clutch is to be held released by the mult starting arm and is not to chatter. To adjust, form lip W.

ADJ. 20 - ESCAPEMENT PAWL DISABLING SLIDE (Repeat Mult)



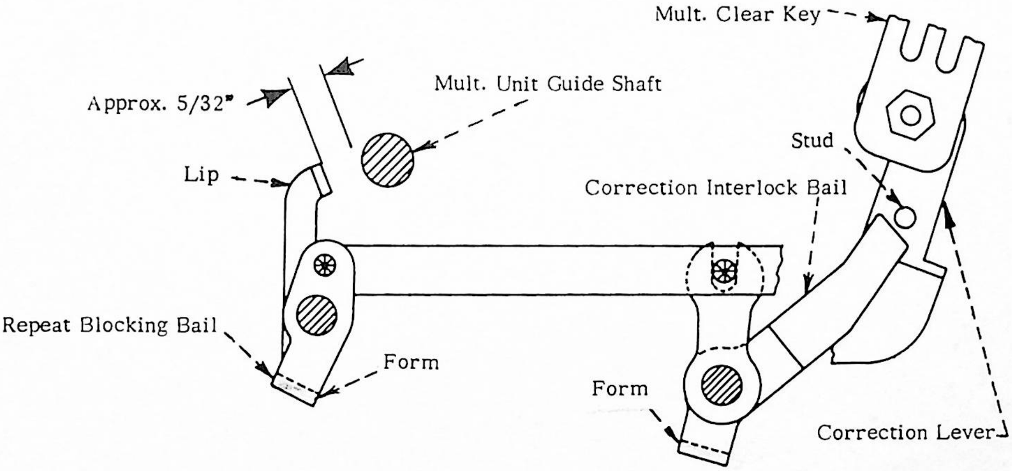
With the machine in a repeat mult operation, the escapement pawl disabling slide is to engage the latch lip on the mult starting arm with a 50% minimum engagement. To adjust, form the control link at the offset.

ADJ. 21 - SELECTOR LOCK INTERLOCK (REPEAT MULT)



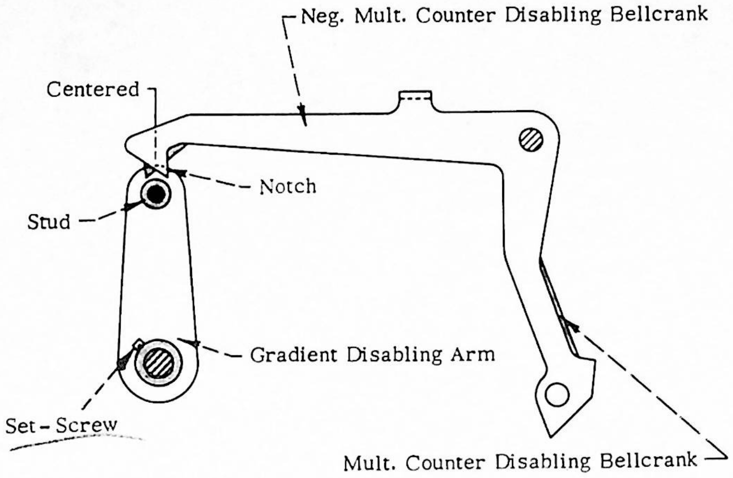
With a number selected in the mult unit, pull the repeat key to the forward position and depress the mult key. At this point, there is to be no pressure and no clearance between lip A and lip B. To adjust, raise or lower the selector lock interlock arm.

ADJ. 22 - MULT CLEAR KEY INTERLOCK (REPEAT MULT)



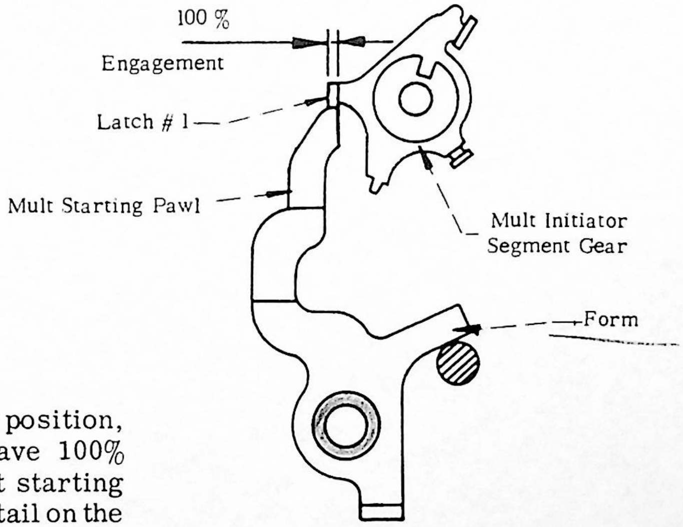
With a number selected in the mult unit and the repeat key in the forward position: (1) The lip on the repeat blocking bail is to clear the mult unit guide shaft approximately 5/32". To adjust, form the repeat block bail. (2) The mult clear key is to be blocked by the correction interlock bail moving under the stud on the correction lever. To adjust, form the correction interlock bail.

ADJ. 23 - GRADIENT DISABLING ARM


Neg. Mult. Counter Disabling Bellcrank
Centered
Notch
Stud
Gradient Disabling Arm
Set - Screw
Mult. Counter Disabling Bellcrank

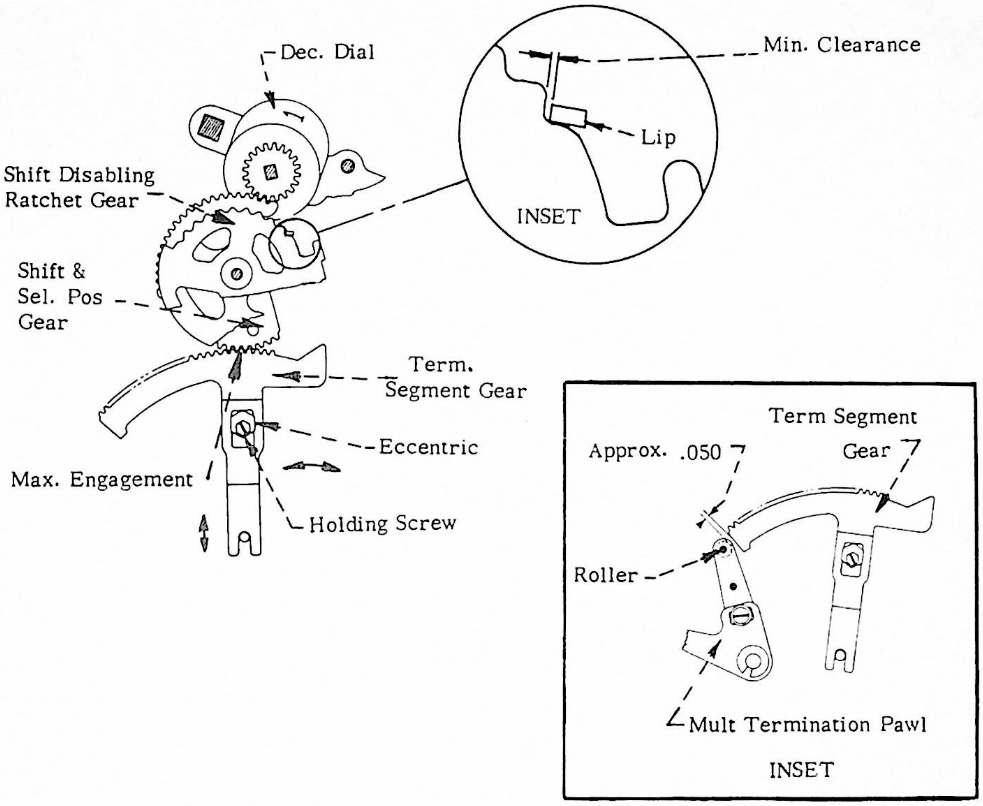
On machines with the gradient counter feature and with the counter control key moved to the gradient position, the stud on the gradient disabling arm is to be centered in the notch formed by the neg. mult counter disabling bellcrank and the mult counter disabling bellcrank. To adjust, loosen the set-screw and rotate the gradient disabling arm on its shaft.

ADJ. 24 - ENGAGEMENT OF THE MULT STARTING PAWL



With the machine in home position, the #1 latch lip is to have 100% engagement with the mult starting pawl. To adjust, form the tail on the mult starting pawl.

ADJ. 1 - TERMINATION GEAR ENGAGEMENT & CLEARANCE FOR RATCHET GEAR LIP



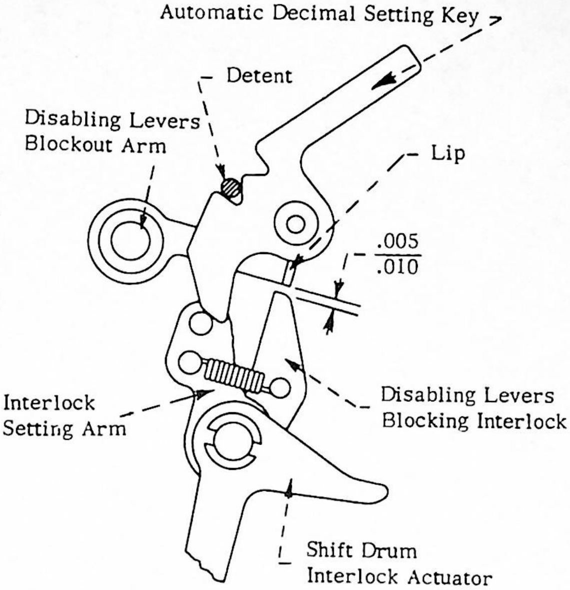
1. The termination segment gear is to have maximum engagement with the shift and selection positioning gear without binding. To adjust, raise the termination segment gear.

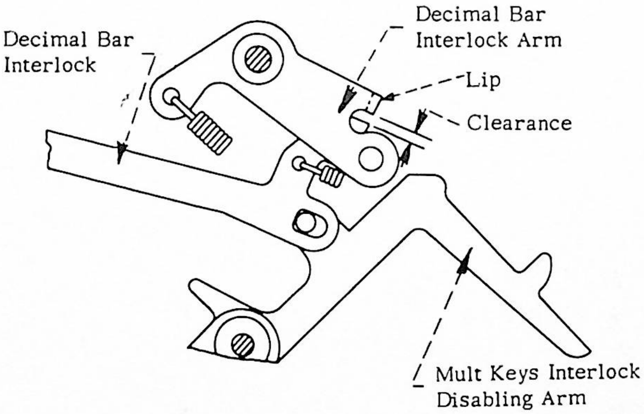
2. When the decimal bar is depressed, the lip on the over selection detecting lever is to move into engagement with the shift disabling ratchet gear with minimum clearance to the rear edge of the ratchet tooth. Also, the shift disabling ratchet gear is to be released from its detent position when the unit is shifted. Check in all decimal position. To adjust, turn the eccentric on the termination segment gear.

Note: Since the eccentric adjustment effects the clearance for the mult termination pawl, it will be necessary to readjust the mult termination pawl for approximately .050" clearance as shown in the Inset. (See mult termination pawl adjustment in the mult adjustment section.)

ADJ. 2 - DISABLING LEVERS BLOCKOUT ARM

With the auto decimal key in the forward position, there is to be .005" to .010" clearance between the lip on the disabling levers blockout arm and the blocking interlock. To adjust, form the disabling levers blockout arm.

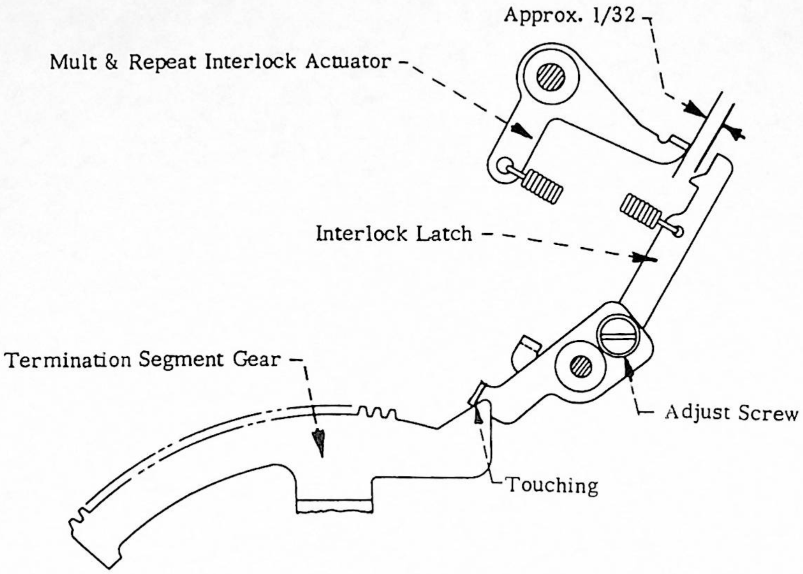

Automatic Decimal Setting Key
Detent
Disabling Levers Blockout Arm
Lip
.005
.010
Interlock Setting Arm
Disabling Levers Blocking Interlock
Shift Drum Interlock Actuator



ADJ. 3 - DECIMAL BAR INTERLOCK

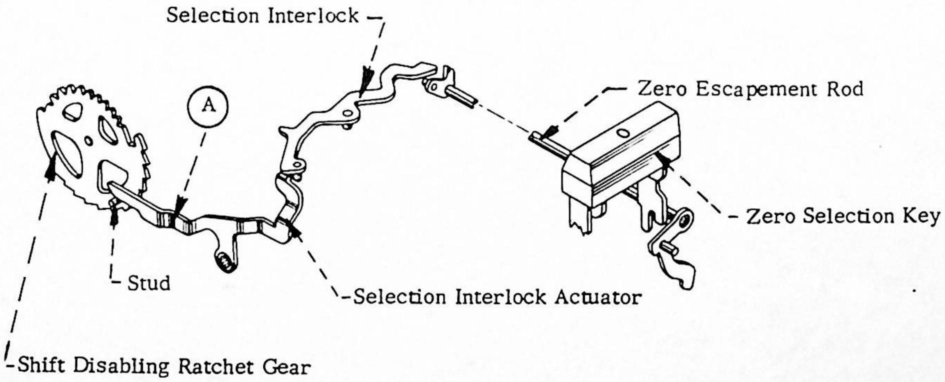
When the decimal bar is depressed and then released, the decimal bar interlock is to move under the lip on the decimal bar interlock arm. In this position, the decimal bar interlock is to be flush with the edge of the lip and have clearance to the underside of the lip. To adjust, form the lip.

ADJ. 4 - TERMINATION



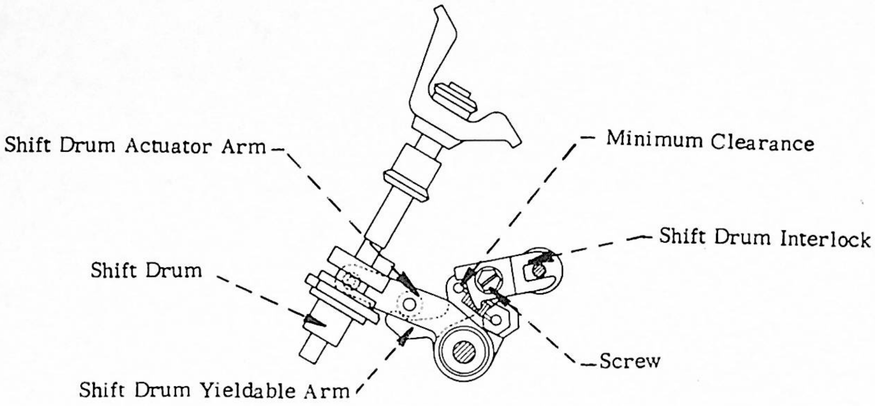
When the mult unit is at its maximum travel to the right, the interlock latch is to have approximately 1/32" clearance to the lip on the mult and repeat interlock actuator. To adjust, move the interlock latch.

ADJ. 5 - SELECTION KEYS INTERLOCK



With the decimal dial setting on "3", depress the decimal bar and then select 2 zeros. At this point, the stud on the shift disabling ratchet gear is to just contact the selection interlock actuator. To adjust, form the selection interlock actuator at point A. After adjusting check to see that the keyboard interlocks after the last digit is entered for the particular decimal setting.

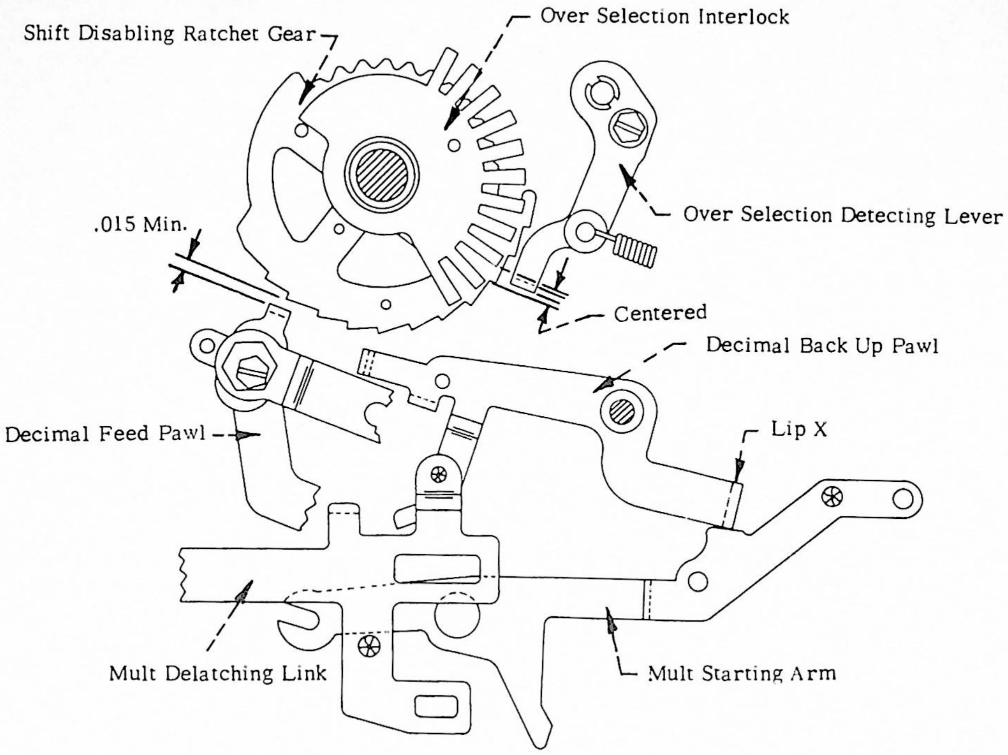
ADJ. 6 - SHIFT DRUM INTERLOCK



With the mult unit in home position and the auto decimal key moved forward and rearward, the shift drum interlock is to move up and down behind the stud on the shift drum yieldable arm with minimum clearance. To adjust, move the shift drum interlock.

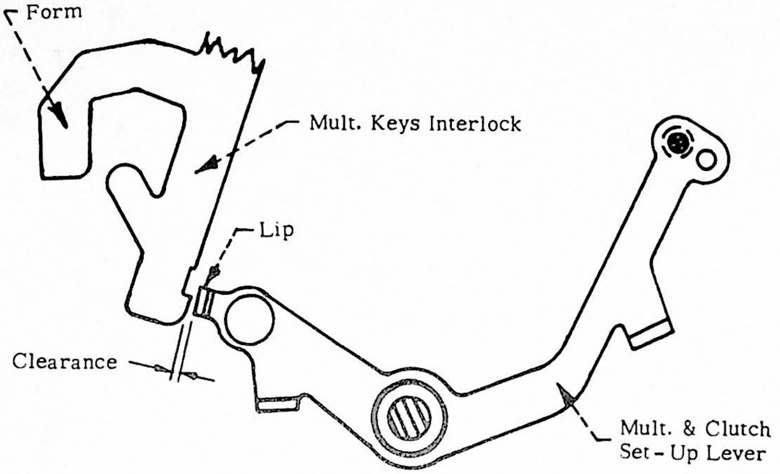
NOTES

ADJ. 7 - OVER SELECTION DETECTING LEVER AND RATCHET GEAR BACK-UP PAWL



1. With the clutch manually released, cycle the drive shaft until the decimal feed pawl moves under the teeth on the shift disabling ratchet gear. At this point, the decimal feed pawl is to have .015" minimum clearance to the teeth on the shift disabling ratchet gear. To adjust, form lip X.
2. When the decimal bar is depressed, the lip on the over selection detecting lever is to move between the slots in the over selection interlock with equal clearance. To adjust, move the over selection detecting lever.

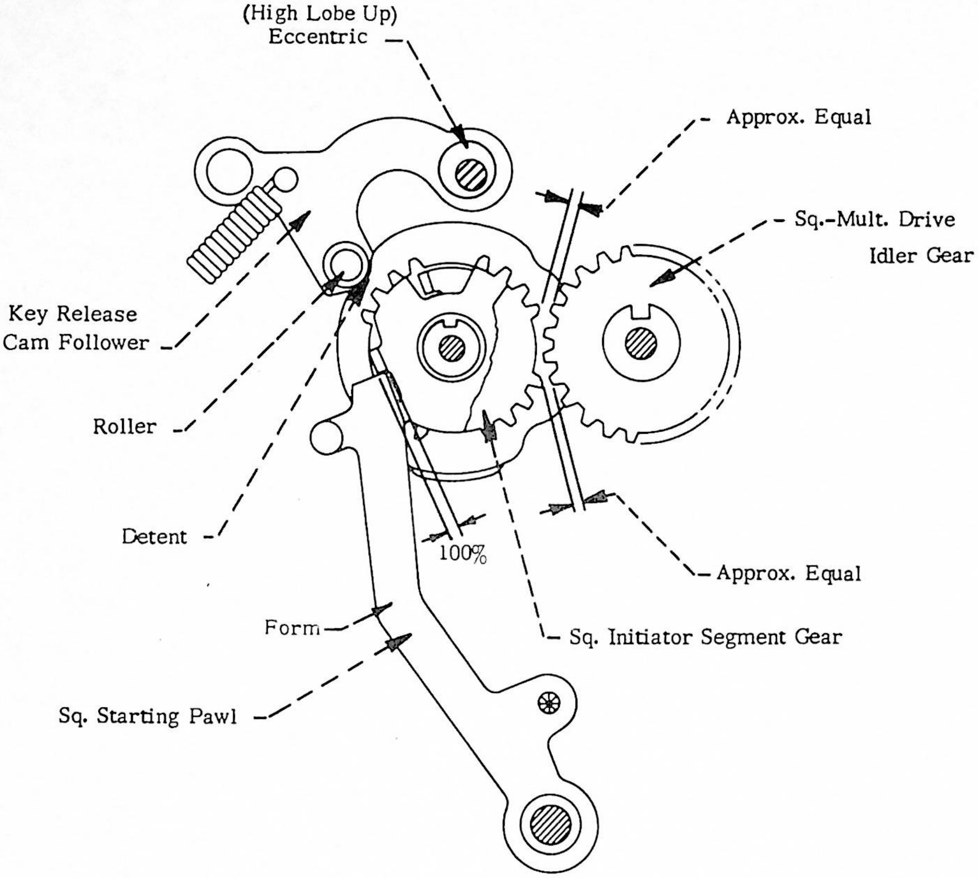
ADJ. 8 - MULT KEY INTERLOCK



With the mult unit and drive shaft in home position, pull the auto decimal key forward and slowly depress the mult key. The lip on the mult and clutch set-up lever is to pass the hook on the mult keys interlock with clearance. To adjust, form the rear arm on the mult keys interlock.

AUTOMATIC SQUARING

ADJ. 1 - CLEARANCE FOR SQ. INITIATOR SEGMENT GEAR

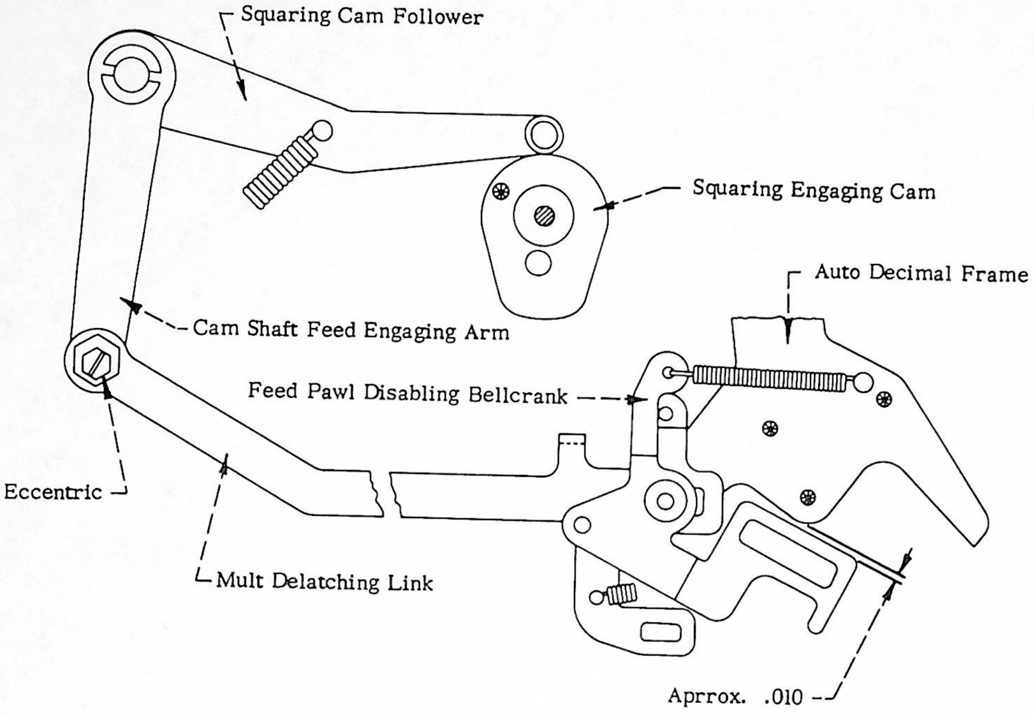


With the squaring initiator segment gear in its detent position: (1) The squaring starting pawl is to have 100% engagement with the latch lip on the squaring initiator segment gear. To adjust, form the squaring starting pawl. (2) As the drive shaft is cycled, the teeth on the squaring mult drive idler gear are to clear the teeth on the squaring initiator segment gear with approximately equal clearance. To adjust, turn the eccentric on the key release cam follower.

NOTES

AUTOMATIC SQUARING

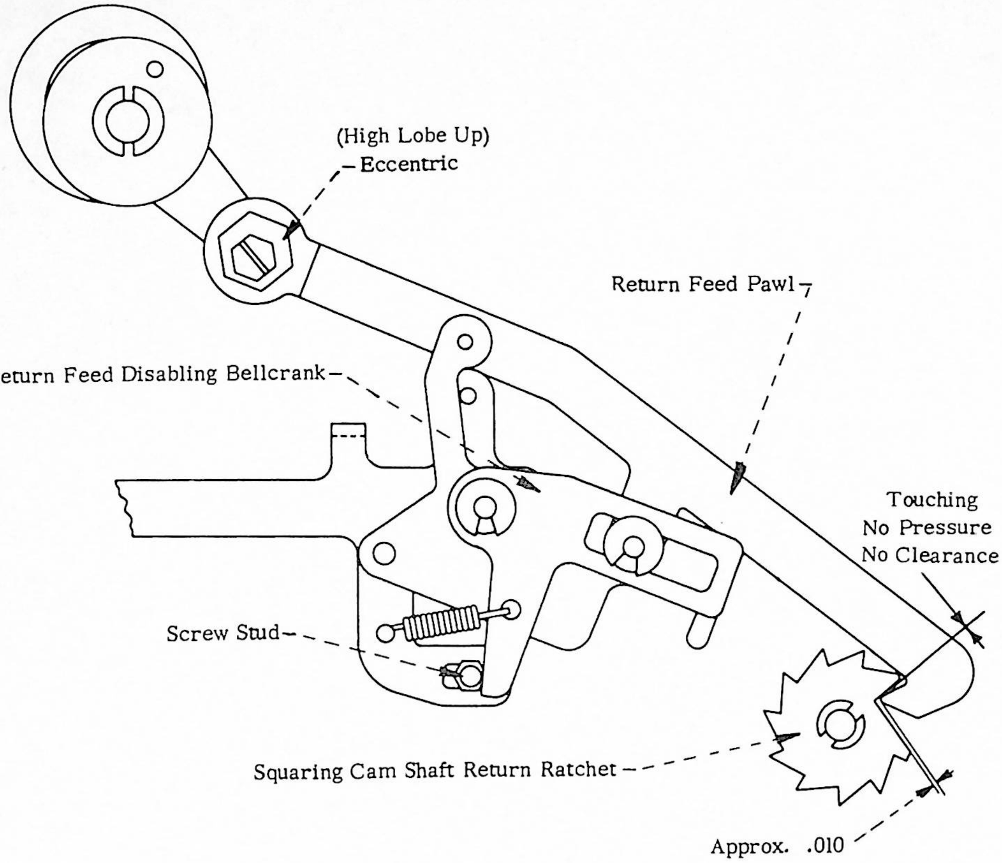
ADJ. 2 - CLEARANCE FOR FEED PAWL DISABLING BELLCRANK



With the machine in home position, there is to be approximately .010" clearance between the feed pawl disabling bellcrank and the auto decimal frame. To adjust, turn the eccentric on the mult delatching link.

NOTES

ADJ. 3 - RETURN FEED PAWL



With the machine in home position:

1. The point on the return feed pawl is to clear the bottom of the ratchet teeth by approximately .010". To adjust, move the screw stud.
2. The point on the return feed pawl is to just touch (no pressure, no clearance) the back side of the ratchet teeth. To adjust, turn the eccentric.

NOTES

ADJ. 4 - MULT-SQUARING STARTING TOGGLE

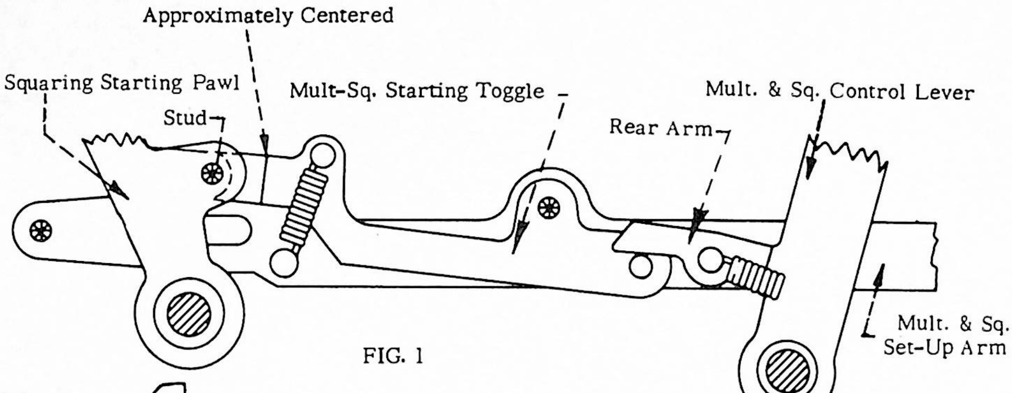


FIG. 1

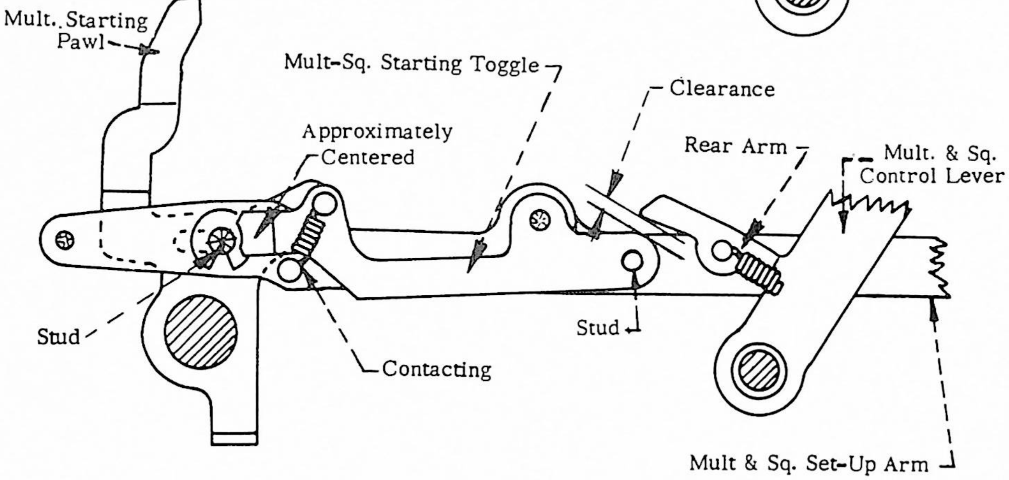


FIG. 2

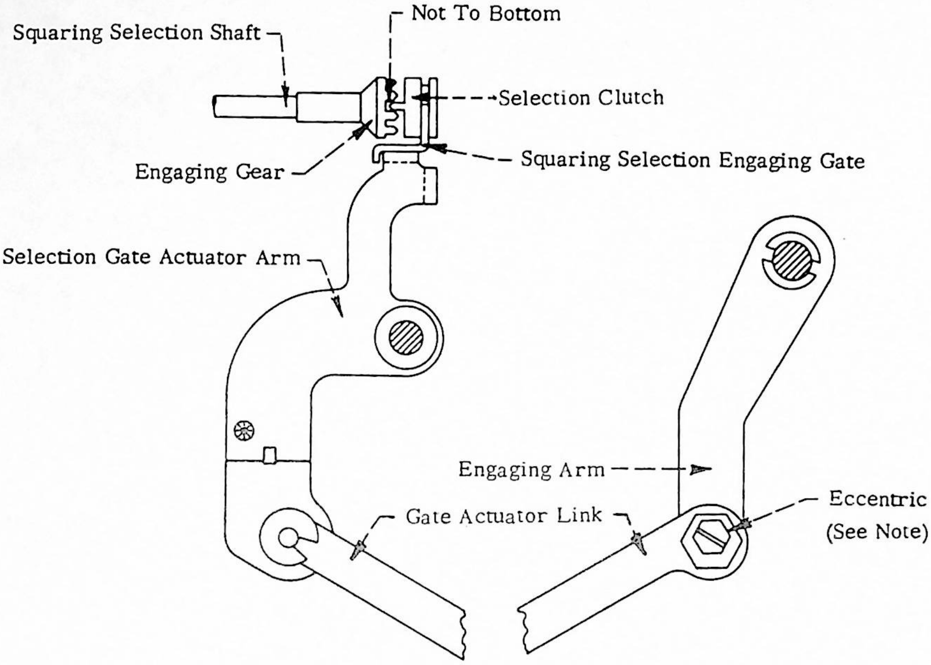
1. With no selection in the mult unit depress the mult-sq. key. The left end of the mult-squaring starting toggle is to pivot upward and be approximately centered with the stud on the squaring starting pawl as shown in Fig. 1.

2. With a selection in the mult unit, and the mult-sq. key depressed, the left end of the mult-squaring starting toggle is to remain in the down position and be approximately centered with the stud on the mult starting pawl as shown in Fig. 2.

To adjust for both conditions, form the rear arm on the mult and squaring control lever.

Note: If the above adjustment does not satisfy both conditions, readjust the lip on the mult and clutch set-up lever as shown in Adj. 5, Fig. 2, page 12-7.

ADJ. 5 - SELECTION CLUTCH ENGAGEMENT



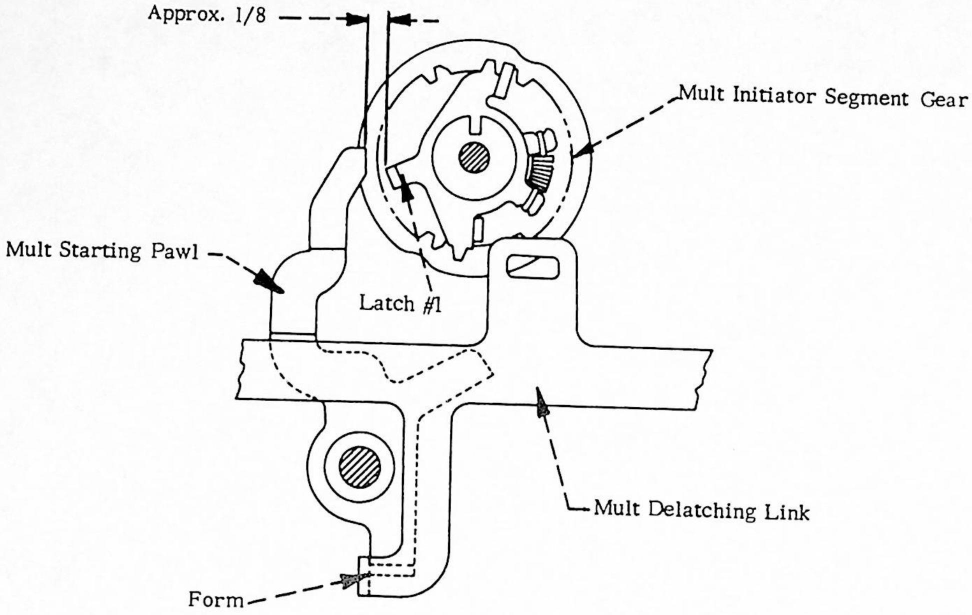
With the machine cycled in squaring until the squaring selection engaging gate is at its maximum forward travel, the selection clutches are to have maximum engagement with their engaging gears, but are not to bottom.

NOTES

To adjust, turn the eccentric on the gate actuator link.

Note: A temporary setting of the Mult Cam Clutch Release (Adj. 13) is necessary before making the above adjustment.

ADJ. 6 - CLEARANCE FOR MULT STARTING PAWL

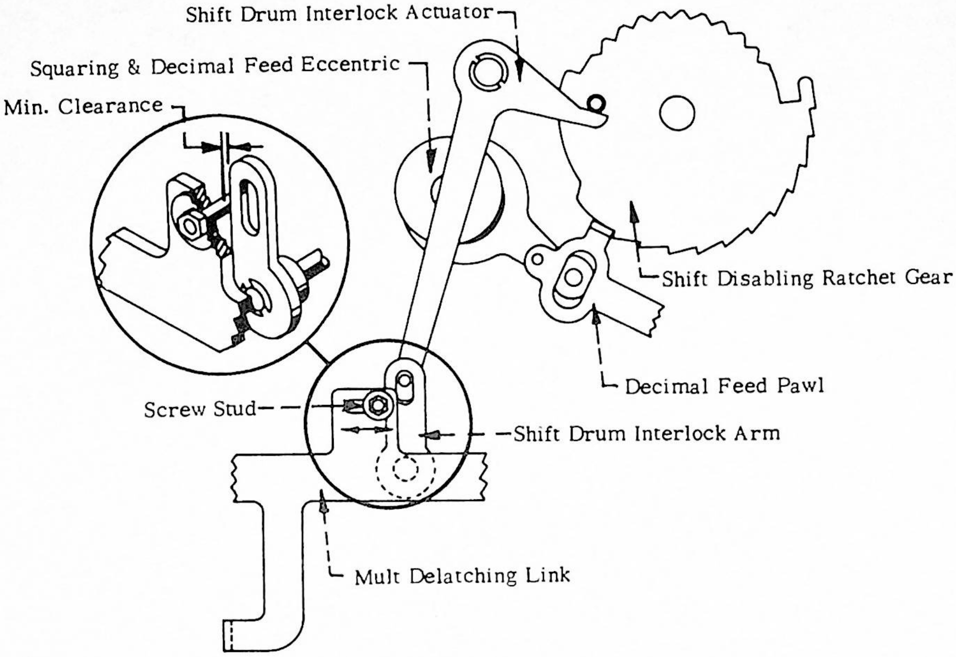


Cycle the machine in squaring until the mult delatching link moves forward. At this point, there is to be approximately 1/8" clearance between the mult starting pawl and the lip on the #1 latch for the mult initiator segment gear. To adjust, form the lip on the mult delatching link.

NOTES

If starting Pawl is Bouncing into Segment Gear & Jamming adjusted to excess of 1/8

ADJ. 7 - MULT SHIFT DISABLING BLOCK


Shift Drum Interlock Actuator
Squaring & Decimal Feed Eccentric
Min. Clearance
Shift Disabling Ratchet Gear
Decimal Feed Pawl
Screw Stud
Shift Drum Interlock Arm
Mult Delatching Link

With several numbers selected in the mult unit, cycle the machine in multiplication until the shift disabling ratchet gear is at its maximum movement as shown. At this point, there is to be minimum clearance (without touching) between the shift drum interlock arm and the screw stud. To adjust, move the screw stud.

ADJ. 8 - SQUARING FEED & SHIFT ENGAGEMENT

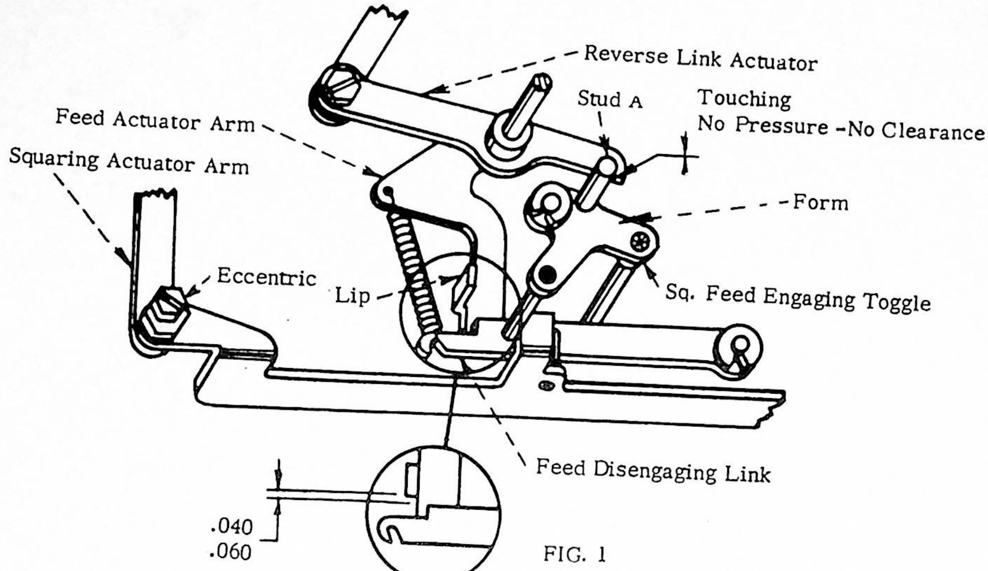


FIG. 1 - SQUARING FEED ENGAGING TOGGLE

With the machine in home position: (1) Stud A is to just contact the reverse link actuator. To adjust, turn the eccentric on the squaring actuator arm. (2) There is to be .040" to .060" clearance between the lip on the feed actuator arm and the upper surface of the feed disengaging link (Inset). To adjust, form the squaring feed engaging toggle at point shown.

Must be checks in Shifting

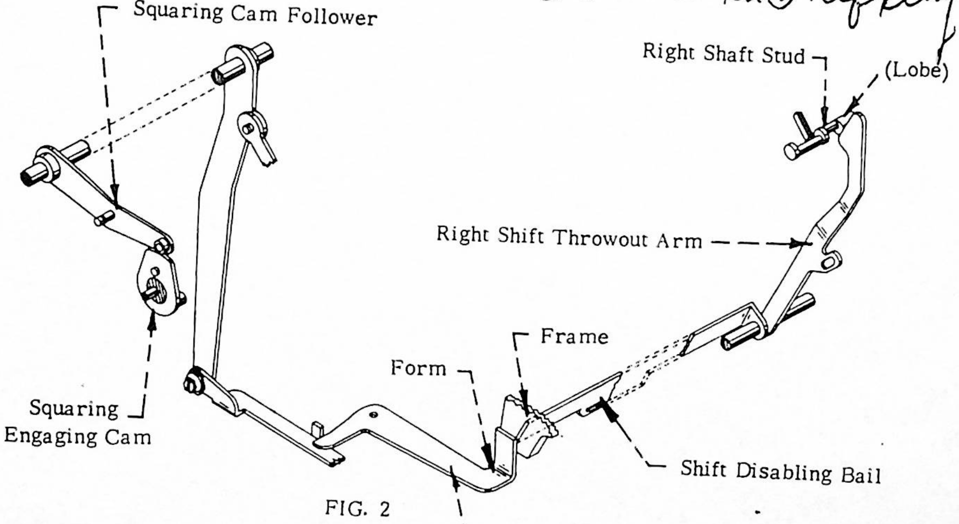
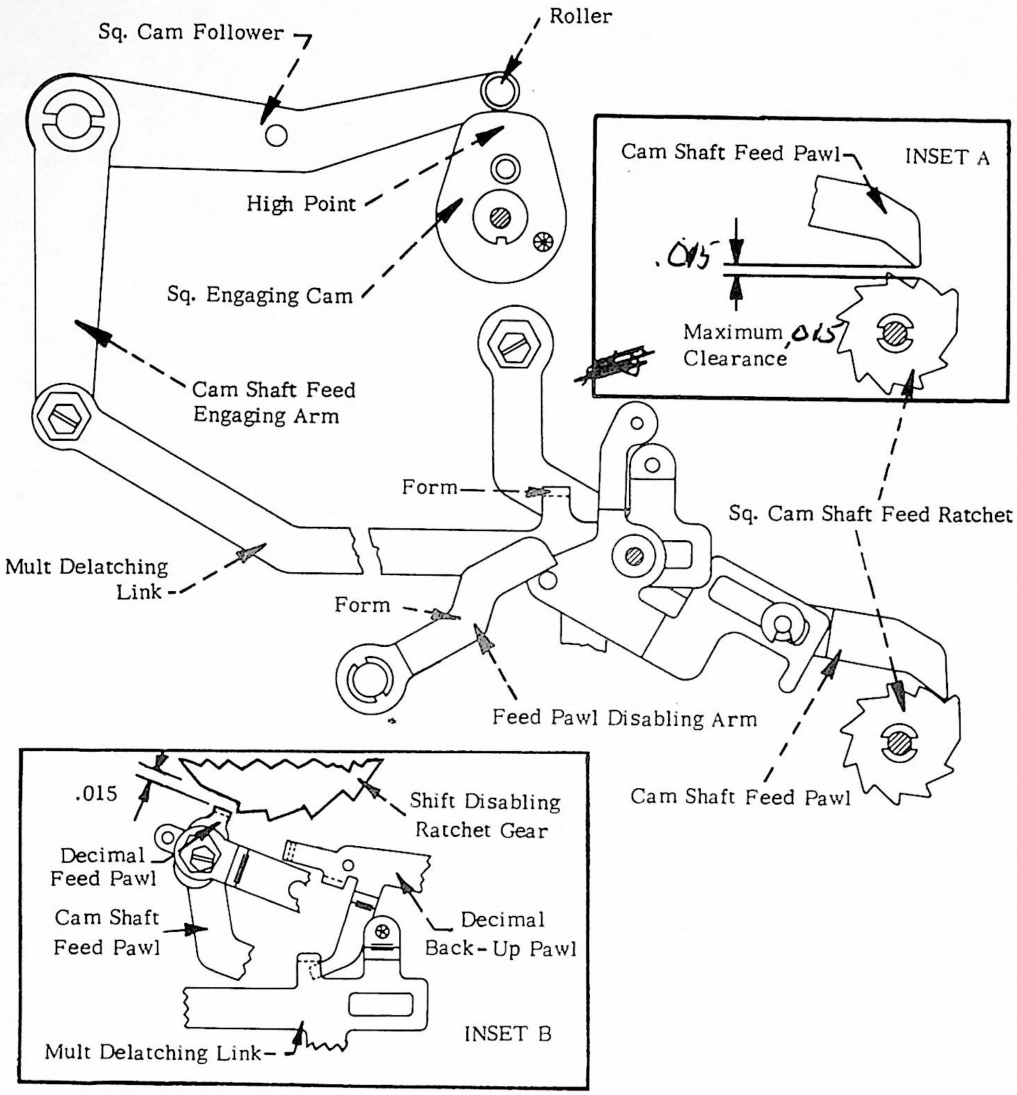


FIG. 2 - ENGAGEMENT OF THE RIGHT SHIFT THROWOUT ARM

Cycle the machine in squaring until the roller on the squaring cam follower is on the high point of the squaring engaging cam. At this point, the right shift throwout arm is to be actuated as far to the right as possible without bottoming the shift engaging bellcrank against the frame. To adjust, form the shift engaging bellcrank.

ADJ. 9 - CAM SHAFT FEED PAWL ENGAGEMENT & DISENGAGEMENT

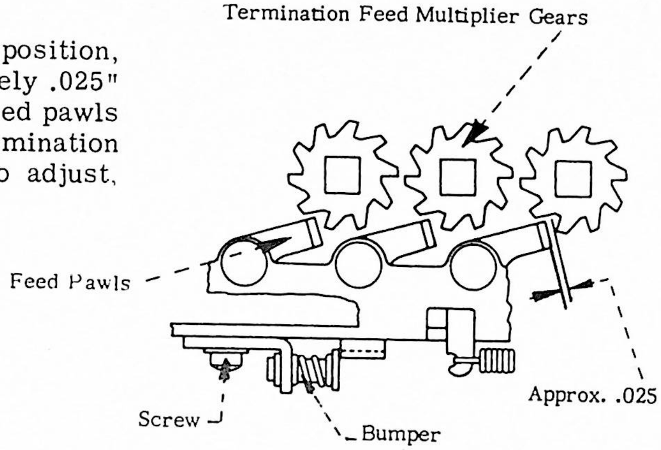


1. With a "5" or any number selected in the 1st column of the main keyboard, cycle the machine in squaring until the cam shaft feed pawl contacts the 1st tooth on the squaring cam shaft feed ratchet and rotates the cam shaft one tooth space. Then on the following feed pawl movements, the feed pawl is to have maximum clearance to the #2 tooth on the ratchet gear as shown in Inset A. To adjust, form the feed pawl disabling arm at point indicated.

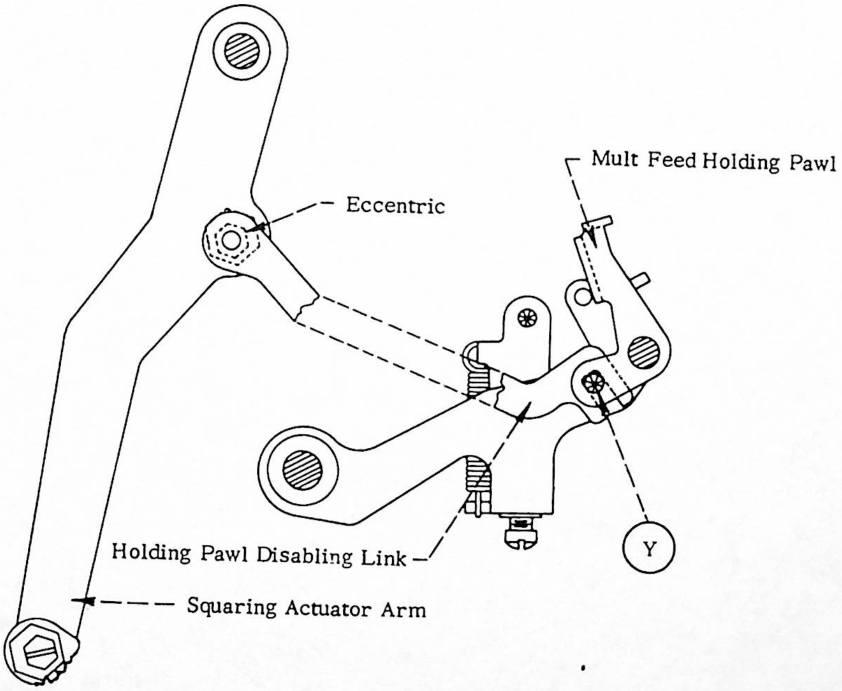
2. During a squaring operation, the decimal feed pawl is to be held below the teeth on the shift disabling ratchet gear with approximately .015" minimum clearance as shown in Inset B. To adjust, form the lip on the mult delatching link.

ADJ. 10 - FEED PAWL CLEARANCE TO TERMINATION FEED MULT GEARS

With the machine in home position, there is to be approximately .025" clearance between the feed pawls and the teeth on the termination feed multiplier gears. To adjust, move the bumper.

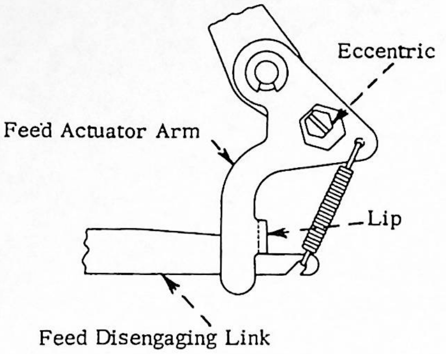


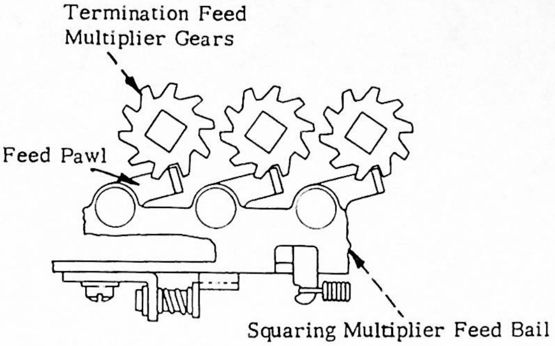
ADJ. 11 - DISABLING THE MULT FEED HOLDING PAWL



Cycle the machine in squaring until the holding pawl disabling link is at its maximum forward movement. At this point, the yoke on the holding pawl disabling link is to block stud Y and prevent forward movement of the mult feed holding pawl. To adjust, turn the eccentric on the holding pawl disabling link.

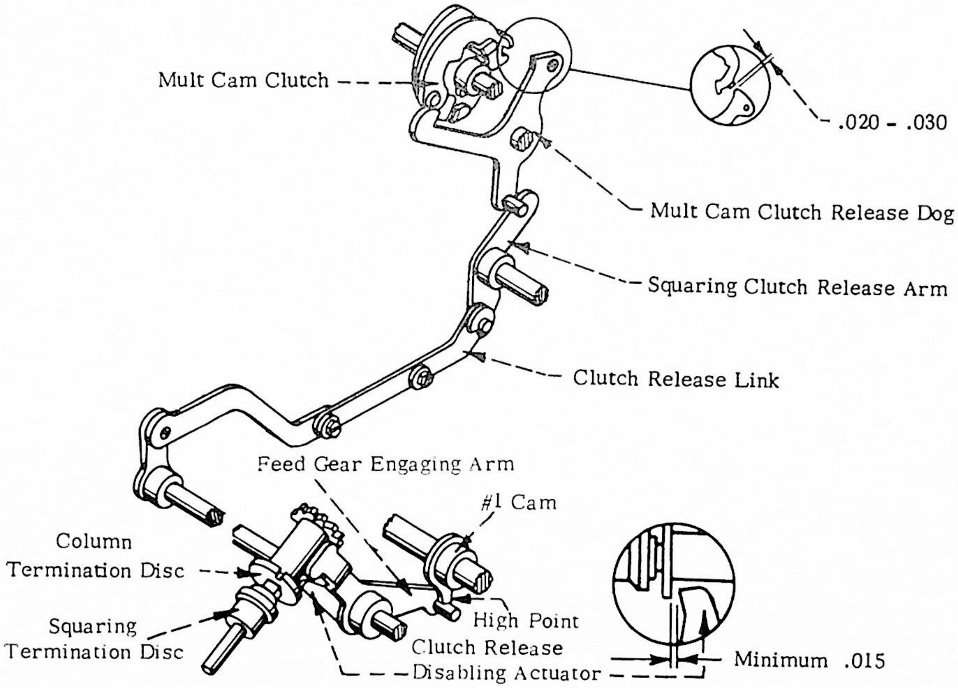
ADJ. 12 -TERMINATION FEED MULTIPLIER GEARS




Termination Feed Multiplier Gears
Feed Pawl
Squaring Multiplier Feed Bail

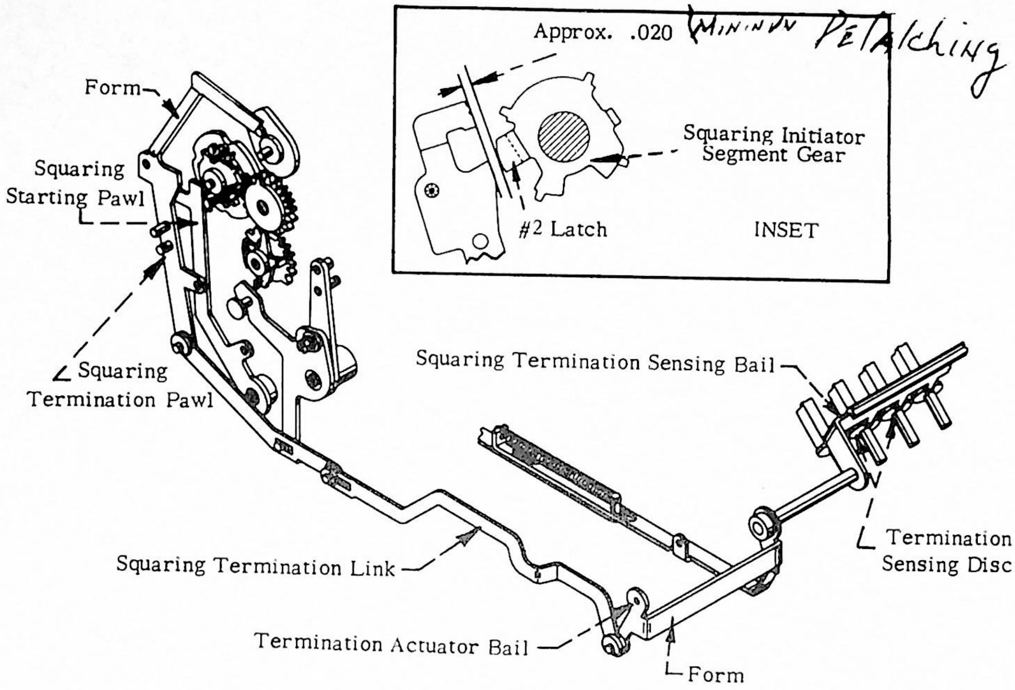
With the machine cycled in squaring, the full feed movement of the feed actuator arm is to fully rotate the termination feed multiplier gear into its next detent position. To adjust, turn the eccentric.

ADJ. 13 - MULT CAM CLUTCH RELEASE



1. With a number selected in the 1st column of the main keyboard, cycle the machine in squaring until the feed gear engaging arm for the 1st column is on the high point of movement with the #1 cam. At this point, there is to be approximately .020" to .030" clearance between the mult cam clutch release dog and the lip on the mult cam clutch as shown in the upper Inset. To adjust, shorten or lengthen the clutch release link.
2. After adjusting as above and with the machine in home position, rotate the column termination discs so their notches are out of line with the clutch release actuators. Then check for a minimum of .015" clearance between the discs and the clutch release actuators as shown in the lower Inset. If this clearance is less than .015" it will be necessary to recheck and readjust the mult cam clutch release dog clearance as shown in the upper Inset.

ADJ. 14 - CLEARANCE FOR SQUARING TERMINATION PAWL

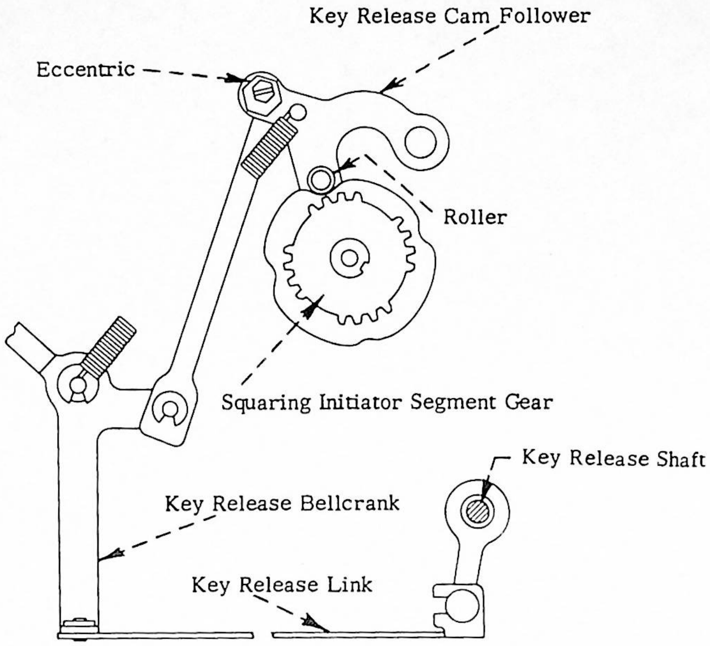

Approx. .020
Squaring Initiator Segment Gear
#2 Latch
INSET
Form
Squaring Starting Pawl
Squaring Termination Pawl
Squaring Termination Sensing Bail
Squaring Termination Link
Termination Sensing Disc
Termination Actuator Bail
Form

Minimum Delatching

1. With a "1" selected in the main keyboard, cycle the machine in squaring until the squaring termination sensing bail drops and engages the notches in the termination sensing discs. At this point, the squaring termination pawl is to have approximately .020" clearance to the #2 latch on the squaring initiator segment gear. To adjust, form the termination actuator bail.

2. Continue to cycle the drive shaft slowly until the roller on the squaring engaging cam has moved the squaring termination pawl to its maximum rearward movement. At this point, the over-center spring between the squaring termination pawl and the squaring starting pawl is to cause the squaring starting pawl to "snap" forward into position to be contacted by the #1 latch on the squaring initiator segment gear. To adjust, form the upper tail on the squaring termination pawl.

ADJ. 15 - RELEASE OF THE MULT-SQUARING KEY



Depress the mult-squaring key and cycle the machine in squaring until the roller on the key release cam follower drops into the lowest detent dwell on the squaring initiator segment gear. At this point, the mult-squaring key is to release, and the key release link is to rotate the key release shaft as far as possible without bottoming. To adjust, turn the eccentric on the key release cam follower.

NOTES

NOTES

Auto Decimal

Set Dial at 7 Make 4 Sel. Try Decimal Bar
No Go Then Try 3 Should be OK

Set Dial at 3 Depress decimal bar Try
for 4 Selection - No Go Then Try 3 Should be OK

Set dial at 1 depress decimal Bar & try for 2 Selection
No Go Then try 1 Should go OK

Set dial at 10 Make one selection [illegible] try
decimal Bar - No Go
Then Try with No Selection Should go